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Structural Equation Modeling Analysis of Etiological Factors in Social Anxiety.

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**STRUCTURAL EQUATION MODELING ANALYSIS OF
ETIOLOGICAL FACTORS IN SOCIAL ANXIETY**

A Dissertation

**Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy**

in

The Department of Psychology

**by
Michele E. McCarthy
B.A., Louisiana State University, 1992
M.A., Louisiana State University, 1995
August 1997**

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DEDICATION

This dissertation is dedicated to my family, without whom none of this would have been possible, and to Steve, without whom it would not have been bearable.

Thank you, Mom and Dad, for raising me to believe in myself.

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The author wishes to thank the members of her committee for their support and guidance, both during this project and throughout her graduate training. Special thanks go to Corby Martin and Bret Bentz for their help in data collection. Long-term thanks go to Mrs. Clay, who stressed the importance of clear writing, and to Mr. Lowery, who encouraged his students to question everything.

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ABSTRACT

The current study investigated possible etiological risk factors in the development of social anxiety. The risk factors examined in this study were *family environment*, *negative peer interactions*, *neuroticism*, *self-perceived attractiveness*, *public self-consciousness*, *social behavior goal ability discrepancy*, and *fear of negative evaluation*. These variables were hypothesized to have both direct and indirect influences on the development of social anxiety. A hypothesized risk factor model was tested employing structural equation modeling (SEM) using questionnaire data collected from 559 college undergraduates. Phases of this study included the refinement of constructs, examination of the internal consistency and discriminant validity of the constructs, examination of the structural model, and cross-validation of modified models. The measurement portion of the study highlighted significant weaknesses in the measures employed, resulting in the trimming of a number of scales. According to the models best supported in the structural modeling portion of the present study, there is a strong, direct influence of neuroticism on social anxiety. Additional variance in social anxiety can be accounted for by a second pathway which suggests that neurotic, publicly self-conscious individuals with patterns of negative social interactions in childhood may develop discrepancies in their ability to meet their goals for social interactions. This social behavior goal-ability discrepancy is the final proximal predictor of social anxiety (in the second pathway), and mediates the effects of the peer interaction, and public self-consciousness variables. Goal-ability discrepancy also mediates a portion of the effect of neuroticism. The

alternate pathways supported in the present investigation may be helpful in elucidating the means by which the general proclivity toward anxiety disorders (based in neuroticism) becomes directed toward particular stimuli.

LITERATURE REVIEW

Social phobia (social anxiety disorder) is characterized by the persistent, excessive fear of humiliation or negative evaluation in social or performance situations (American Psychiatric Association, 1994). Feared situations may include public speaking, formal and informal social gatherings, interactions with authority figures, and situations requiring assertiveness (Holt, Heimberg, Hope, & Liebowitz, 1992; Rapee, Sanderson, & Barlow, 1988; Turner, Beidel, & Townsley, 1992). Public speaking is the most common feared situation. However, social phobics presenting clinically typically report fearing a number of situations involving evaluation of their performance (Holt et al., 1992; Turner, Beidel, Dancu, & Keys, 1986). This fear often leads to avoidance of social/evaluative situations, although some social phobics endure their feared settings while experiencing extreme distress (American Psychological Association, 1994). In addition to avoidance, social anxiety may be manifest in physical symptoms such as blushing, excessive perspiration, gaze avoidance, heart palpitations, or panic attacks, or in cognitive symptoms such as heightened self-awareness and apprehension (Heckelman & Schneier, 1995).

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychological Association, 1994), social phobia may be diagnosed with the presence of excessive fear occurring invariably upon exposure to social situations, which are avoided by the individual, or endured with distress.

Recognition of the unreasonable nature of the fear is required for diagnosis, as is distress, or a significant disruption of normal activities by avoidance, anticipatory anxiety, or fear experienced during the social situation. For a diagnosis of social phobia using DSM-IV criteria, duration of the disturbance must be at least six months in individuals below the age of eighteen, and the presentation may not be better accounted for by another mental disorder, a general medical condition, or the direct physiological effects of a substance. In the presence of another physical or mental disorder, the observed fearfulness and avoidance may not be secondary to the other condition (e.g., fear of trembling in Parkinson's disease).

The DSM-IV allows for the specification of only one subtype, that of *generalized* social phobia, in which the patient fears most social situations (American Psychological Association, 1994). This quantitative distinction of subtypes has been supported by research showing that generalized social phobics are less educated, more anxious, more depressed, and more functionally impaired than are nongeneralized (discrete) social phobics (Heimberg, Hope, Dodge, & Becker, 1990; Holt, Heimberg, & Hope, 1992; Turner et al., 1992). When compared to discrete social phobics, generalized social phobics are also more likely to be single, have a higher rate of alcoholism, have a lower rate of panic disorder, and have an earlier age of onset of the disorder (Mannuzza, Schneier, Chapman, Liebowitz, Klein, & Fyer, 1995). In addition, generalized social phobics are more likely to have social phobic first degree relatives.

Epidemiology

Although lifetime prevalence of severe social fear is very high (22.6%; Pollard & Henderson, 1988; 33%; Stein, Walker & Forde, 1994), estimates of social phobia which include the DSM requirement of "marked interference or distress" are much lower. The lifetime prevalence estimate based on DSM-III-R criteria is 13.3%, making social phobia the most common anxiety disorder (Kessler, McGonagle, Zhao, Nelson, Hughes, Eshelman et al., 1994).

Although social phobics in treatment settings are slightly more likely to be male, Epidemiological Catchment Area studies suggest that social phobia is more commonly found in women (3.1% lifetime prevalence) than in men (2.0% lifetime prevalence) (Rapee et al., 1988; Schneier, Johnson, Hornig, Liebowitz, Weissman, 1992; Solyom, Ledwidge, & Solyom, 1986). The Schneier et al. (1992) data also indicate that social phobia is more common in young, unmarried, poorly educated, low socio-economic status individuals.

Mean age of onset of social phobia is thought to be in the mid to late teens, although a tendency towards social reticence may be found in some individuals from infancy (Mannuzza, Fyer, Liebowitz, & Klein, 1990; Rosenbaum, Biederman, Hirshfeld, Bolduc, & Chaloff, 1991; Rubin & Asendorpf, 1993). Social phobics typically present for treatment 15 to 25 years following onset of the disorder, and the mean age of presentation is 30 years (Rapee et al., 1988; Solyom et al., 1986). Both prospective and retrospective studies indicate that social phobia/social anxiety has a relatively stable course (Caspi, Elder, & Bem, 1988; Solyom et al., 1986).

Social Phobia and Shyness

Although not a formal diagnostic category, the trait descriptor shyness overlaps considerably with social phobia. The cognitions, self-descriptors, fears, somatic symptoms, and responses of shy and social phobic groups have been found to be very similar in a number of studies (Amies, Gelder, & Shaw, 1983; Kagan, Resnick, & Snidman, 1988; Ludwig & Lazarus, 1983; Turner & Beidel, 1989), and shyness and standard measures of social anxiety have been found to correlate highly (e.g., approximately .80; Cheek & Melchior, 1990; Nunnally, 1978; Pilkonis 1977a). However, social phobics typically exhibit more extreme functional deficits, avoidance behaviors, and physiological reactions to evaluation than do shy individuals (Turner, Beidel, & Larkin, 1986; Turner, Beidel, & Townsley, 1990). Although the self-defined nature of shyness leads to considerable heterogeneity within samples, no qualitative distinctions between shyness and social phobia have been found, and measures designed to measure these constructs are highly correlated (Cheek & Melchior, 1990). Recent studies (e.g., Hofmann & Roth, 1996; Schneier et al., 1991; Turner, Beidel, Borden, Stanley, & Jacob, 1991) provide further evidence of social fear as a continuum, therefore, it is not unreasonable to suspect that social phobia and shyness may overlap to some degree. It may even be possible to conceptualize shyness as subclinical social phobia, possibly the lower end of a spectrum bounded at the top by avoidant personality disorder. As yet, however, no prospective longitudinal studies have been conducted to examine whether childhood shyness leads to, or predisposes one to, adult social phobia (Fyer, 1993).

Social phobia shares with social anxiety/shyness the tendency toward excessive concern about social and evaluative threat, therefore, personality theories about the antecedents of shyness may be useful in highlighting possible antecedents of social phobia (Bruch, Heimberg, Berger, & Collins, 1989). Buss' theory (1980, 1986) proposes childhood social isolation, familial emphasis on the importance of others' opinions, and de-emphasis on family sociability as antecedents to shyness. A review of the social anxiety literature also indicates a possible etiological role of neuroticism, low self-perceived attractiveness, high public self-consciousness, social skills goal/ability discrepancy, and fear of negative evaluation in the development of social fear. A review of these factors follows, which emphasized the interrelationships among these constructs.

Family Environment and Social Anxiety

Overprotective/Rejecting Parenting Styles

The link between certain parenting styles and social reticence has been extensively investigated, dating back to Symonds in 1939, who attributed shyness to parental restrictiveness, criticism, and overprotection. Much of the parental antecedents research was prompted by the use of social phobics as contrast populations for investigations of familial processes in agoraphobia (e.g., Arrindell, Emmelkamp, Monsma, & Brilman, 1983; Parker, 1979). Parker (1979) reported that social phobics perceive both their mother and their father to be high on overprotection and low on emotional support. The Arrindell et al. (1983) study replicated the Parker (1979) results in the areas of overprotection and emotional support and, in addition, found that

social phobics retrospectively rate their parents as high in rejection. Parker (1979) suggested that rejecting parenting styles may inhibit the development of an appropriate parent-child relationship, thereby initiating a lifelong pattern of odd interpersonal interactions. Subsequent studies have continued to find an association between overprotectiveness and social phobia (Bruch, Heimberg, Berger, & Collins, 1989; Arrindell, Kwee, Methorst, Van der Ende, Pol, & Moritz, 1989) and between neglectful/rejecting parenting styles and social anxiety (Morris & Huffman, 1996).

More recent research has conceptualized rejecting parenting styles as similar to shame discipline, which was found to be significantly more prevalent in the rearing of generalized and nongeneralized social phobics as compared to normal control subjects (Bruch & Heimberg, 1994; Leung, Heimberg, Holt, & Bruch, 1994). Social anxiety and overcontrolled parenting lacking in emotional warmth have continued to be found to be related in more recent investigations (e.g., Morris & Huffman, 1996). Bruch and Heimberg (1994) also found isolation, which is similar to overprotection, to be more prevalent in the rearing styles of generalized social phobics than nongeneralized phobics or normals.

The findings in the social phobia literature of a role of overprotective and rejecting parenting styles are mirrored in the shyness literature (Allaman et al., 1972, Baumrind, 1967, Becker, 1964; Mills & Rubin, 1993). The personality psychology investigations of shyness have been interpreted within the conceptual framework of rejecting parenting styles as a risk factor for excessive preoccupation with evaluation by others (Allaman, Joyce, & Crandall, 1972). This theory has been supported by

longitudinal research indicating a stable relationship between children's perceptions of both parents as rejecting, and their own high need for approval (Allaman et al., 1972). Additional support is derived from studies showing an inverse relationship between parental acceptance (low rejection) and self-rated and other-rated social reticence (Armentrout, 1971; Eastburg & Johnson, 1990). Finally, Bell and colleagues have found that parents who are not rejecting of their children (close parent-child relationships) are likely to have more outgoing offspring with greater social self-esteem, and more frequent and satisfying peer interactions (Bell, Avery, Jenkins, Feld, & Schoenrock, 1985).

Increased Parental Concern with Others' Opinions

Because fear of potential and real social evaluation is a hallmark of social phobia, Buss' (1980, 1986) theory about the evolution of shyness/social evaluative concern appears to be relevant. Buss proposed that parental preoccupation with the opinions of others as manifested by overconcern with a child's public image (e.g., grooming, dress, manners, etc.) would lead to fear of negative evaluation. Although this idea has received little empirical attention, a pair of recent studies have found support for Buss' theory. Bruch and colleagues (Bruch, Heimberg, Berger, & Collins, 1989) found that social phobics were more likely than agoraphobics to perceive their parents as overly concerned with the opinions of others. Bruch and Heimberg (1994) found that both generalized and discrete social phobics reported more parental emphasis on the opinions of others than did control subjects. Leung et al. (1994) also found social phobics to be more likely than controls to have been reared in families who

over-emphasized others opinions. Early reports from prospective research currently in progress suggests that socially anxious adolescents report higher levels of parental emphasis on others' opinions than non-socially anxious adolescents (Caster et al., 1996).

Family Insularity/Decreased Family Sociability/Parental Social Anxiety

Buss' (1980, 1986) theoretical antecedents to shyness also include parental child-rearing practices which de-emphasize family sociability. Decreased family sociability, combined with a sensitivity to social evaluation, could prevent the child from engaging in social activities which could lead to habituation of social fear. The Bruch et al. (1989) and Leung et al. (1994) studies found decreased family sociability in the families of social phobics in comparison to the families of non-disordered controls. Bruch and Heimberg (1994) extended these results by finding that generalized social phobics report their families to be significantly less sociable than the self-reported family characteristics of discrete social phobics who, in turn, report significantly less sociability in their families than do normal controls. Prospective research in an adolescent population also notes increased reported isolation in the families of socially anxious adolescents when compared with non-anxious youth (Caster et al., 1996). Again, the shyness literature is in agreement in the finding that shyness is inversely related to family exposure to social situations (Daniels & Plomin, 1985; Moos, 1986).

A closely related notion is the concept that parental social anxiety may limit socialization of the family, leading to a possible modeling of social fear, lack of exposure to social situations, and lack of opportunities for social skills acquisition

(Buss, 1980; Plomin & Daniels, 1986). Both genetic and environmental implications are derived from theories about parental sociability. Adoption studies by Plomin and colleagues indicate an inverse relationship between biological and adoptive mothers' sociability and a child's shyness (Daniels & Plomin, 1985; Plomin & Daniels, 1986; Plomin & DeFries, 1983, 1985). Plomin and Daniels (1986) interpreted these findings as an indication that biological/genetic influences on social reticence are exacerbated when family environments also promote shyness (genotype-environment correlations, e.g., Scarr, 1987). Recent investigations have indicated that mothers of social phobics are rated as more socially avoidant by their children than are mothers of agoraphobics (Bruch, Heimberg, Berger, & Collins, 1989), and generalized social phobics rate their mothers as more fearful and avoidant than do nongeneralized social phobics or controls (Bruch & Heimberg, 1994). These findings are generally consistent with research indicating that social phobics have significantly more social phobic first-degree relatives than do non-disordered controls (Fyer, Mannuzza, Chapman, Liebowitz, & Klein, 1993).

Peer Relations and Social Anxiety

Retrospective accounts of childhood peer group relations have received little attention in the social phobia literature. However, studies examining peer relations of social phobic children are available. Research by Rubin, LeMare, and Lollis (1990) suggests that social anxiety in childhood disrupts social skills acquisition and friendship establishment, leading to increased negative self-evaluation. Although not specific to

social phobia, anxious children have, in general, also been shown to be liked less by their peers (Strauss, Frame, & Forehand, 1987).

The shyness literature has been much more active in examining childhood peer relations. Zimbardo and Radl (1981) found that shy children had fewer friends, by teacher rating, than did non-shy children. Extensive peer nomination research by Coie and colleagues has shown that shy children are primarily neglected/unnoticed by peers (neither liked nor disliked; Coie & Dodge, 1983; Coie, Dodge, & Coppotelli, 1982; Coie & Kupersmidt, 1983). These researchers have found children's social status to be somewhat malleable if children are transplanted into different environments (Coie & Dodge, 1983; Coie & Kupersmidt, 1983). However, their research strongly indicates that neglected children are less likely to approach and interact with other kids socially, although the other kids do not approach them less (Dodge, Coie, & Brakke, 1982). These findings suggest that shy children are not inherently unlikable, however, their social reticence may make it less likely that they can learn the social skills which would allow them to become part of the social mainstream. Further support for this finding can also be found in recent studies showing that submissive adolescents are more likely to be socially anxious than are adolescents whose peer interactions are characterized by cooperation and friendliness (Walters, Cohn, & Inderbitzen, 1996). Other studies have found the social behavior of socially anxious individuals to be more submissive (Hope, Sigler, Penn, & Meier, 1996 cited in Walters et al., 1996) and less cooperative (Walters & Hope, 1996 cited in Walters et al., 1996) than normal controls.

Gilmartin (1987) cites anecdotal, retrospective data which suggests the neglect of shy children by their peers. Gilmartin's data also suggests that shy males are often harassed during childhood by their peers. Olweus (1984) links shyness and peer abuse by postulating that a history of victimization teaches social avoidance. Recent investigations by Olweus (1993) and Bruch and Cheek (1995) also highlight the possibility that negative peer interactions, as opposed to merely neglect experiences, are common for shy children and adolescents. A 1984 study by Ishiyama of retrospective reports by shy adults is consistent with the findings of Olweus (1993) and Bruch and Cheek (1995). Ishiyama's (1984) shy adults reported that childhood teasing, harassment, and ridicule helped to maintain their shyness into adulthood.

A prospective study by Vernberg, Abwender, Ewell, and Beery (1992) appears to shed some light on the directionality of peer neglect and shyness. These researchers conducted a 9 month study of social interactions among children who had recently relocated. It was found that lower levels of intimacy and companionship led to increases in the cognitive aspects of shyness (increased fear of negative evaluation). Interestingly, none of the social anxiety components examined predicted subsequent rejection by peers. Rejection early in the school year correlated with increased fear of negative evaluation, and rejection later in the school year was associated with social avoidance and distress. In summary, their findings did not support the concept of shyness as an elicitor of rejection, but as a possible cognitive consequence of rejection.

Neuroticism and Social Anxiety

High levels of neuroticism have been related to shyness and the development of anxiety disorders through a hypothesized mechanism of increased sensitivity to social evaluation or traumatic conditioning experiences (Eysenck, 1982) resulting from physiological over-reactivity (e.g., behavioral inhibition, C.F., Kagan, Resnick, Snidman, Gibbons, & Johnson, 1988, Kagan, Snidman, & Arcus, 1992; Mineka & Zinbarg, 1995; Zinbarg & Reville, 1989). Studies by both Amies, Gelder, and Shaw (1983) and Watson, Clark, and Carey (1988) have found high neuroticism among social phobics. These results were replicated and extended by Stemmerger, Turner, Beidel, and Calhoun (1995) who found greater neuroticism in generalized than discrete social phobics. Both patient groups were higher in neuroticism than nonpatient controls.

Studies of shyness have also highlighted a role for neuroticism. Pilkonis (1977b) observed a significant correlation between shyness and neuroticism in a study of shy college students. Other shyness /neuroticism correlations have been reported by Briggs, Snider, and Smith (cited in Plomin & Daniels, 1986) and Jones, Briggs, and Smith, 1986. Extremely shy men were shown by Gilmartin (1987) to score above their respective age-referenced norms on a measure of neuroticism, and also scored higher than did nonshy men of the same age. Finally, neuroticism was found by Pilkonis (1977a) to differentiate shy males from controls.

Physical Attractiveness and Social Anxiety

The social advantages of being physically attractive have been widely documented in the literature examining the "what is beautiful is good" hypothesis (e.g.,

Aron, 1988; Berscheid, 1985; Berscheid, Dion, Walster, & Walster, 1971; Berscheid & Walster, 1974; Cann, Siegfried, & Pearce, 1981; Dion, 1981; Feingold, 1992; Hatfield & Sprecher, 1986; Thornton & Ryckman, 1983). Attractiveness, or even the belief that someone is attractive, has been shown to play a crucial role in social interaction (Goldman & Lewis, 1977; Reis, Nezlek, & Wheeler, 1980; Snyder, Tanke, & Berscheid, 1977). For example, Reis et al. (1980) found other-rated physical attractiveness to be significantly correlated with the number of opposite sex interactions reported by men. In addition, attractiveness was found to be significantly correlated with interaction quality and satisfaction for both males and females. The increase in pleasantness and positivity of social interactions due to attractiveness has also been reported by Reis et al. (1982), Garcia, Stinson, Ickes, Bissonnette, and Briggs (1991), and Cash and Burns (1977).

The strong evidence for attractiveness as a social facilitator led to the hypothesis that socially anxious individuals may have awkward interactions due to decreased attractiveness. Although early research suggested that socially reticent individuals may be less attractive than controls (Jones & Russel, 1982; Pilkonis, 1977), the preponderance of the evidence does not support decreased objective attractiveness as a characteristic specific to socially anxious or shy individuals (Bruch, Giordano, & Pearl, 1986; Cheek & Buss, 1981; Cheek & Melchior, 1990; Garcia et al., 1991; Jones & Briggs, 1984; Jones, Briggs, & Smith, 1986).

Physical attractiveness ratings by others are not negatively correlated with self-reported social reticence. However, shyness is inversely correlated with self-

reported physical attractiveness (Bruch, 1993; Bruch, Giordano, & Pearl 1986; Lieberman & Cheek, 1983; Mamrus, O'Connor, & Cheek, 1983). In a particularly important finding, physical attractiveness self-esteem was found to mediate the relationship between public self-consciousness and shyness (Bruch, 1993). Self-rated physical attractiveness was found to decrease the probability that an individual high in PSC would be shy. The developmental effects of self-perceived unattractiveness have not been examined, however, they could be particularly important in the etiology of social anxiety.

Public Self-Consciousness and Social Anxiety

Public self-consciousness is the tendency to view oneself as a social object, and to contemplate the reactions of others to oneself (Fenigstein, Scheier, & Buss, 1975). This awareness of the perspectives of others relative to your social behavior has been oft hypothesized as a precondition for social anxiety (e.g., Buss, 1980, 1986; Fenigstein et al., 1975; Schlenker & Leary, 1982). It is assumed that the ability to view one's behavior as a spectator must be present before a judgment of oneself from that perspective may be made. However, social reticence and public self-consciousness are not synonymous; If one judges oneself positively, then awareness of the perspective of others would not produce anxiety (Fenigstein et al., 1975).

Schlenker and Leary (1982) proposed that high public self-consciousness increases an individual's vulnerability to social anxiety by increasing the salience of social goals, thereby increasing the individual's motivation to make a particular impression. They also hypothesized that high public self-consciousness may increase

an individual's doubt about the impression he/she is making by interrupting social feedback. This is consistent with evidence that increased self-directed attention leads to negative cognitions during social tasks (Fenigstein, 1979; Burgio, Merluzzi, & Pryor, 1986) and decreases one's ability to interpret social cues (Hartman, 1983; Wine, 1971). Relevant to these findings are studies showing that social phobics are less aware and less knowledgeable about their interaction partners (Alden & Wallace, 1995).

High public self-consciousness has been found to be correlated with shyness (Check & Buss, 1981; Pilkonis, 1977b), social reticence (Jones & Russel, 1981 cited in Schlenker & Leary, 1982), interaction anxiousness (Leary, 1983), and embarrassment (Froming & Brody, 1981 cited in Schlenker & Leary, 1982). Most standard measures of social anxiety, including the Fear of Negative Evaluation Scale (FNE; Watson & Friend, 1969), the Social Anxiety and Distress Scale (SAD; Watson & Friend, 1969), and the Social Interaction Self-Statement Test (SISST; Glass, Merluzzi, Biever, & Larsen, 1982) have been found to be related to public self-consciousness, as have observer ratings of subjects' behavior in social situations (Hope & Heimberg, 1988). Social phobics have also been demonstrated to be higher in public self-consciousness than are agoraphobics (Bruch et al., 1989) or nondisordered controls (Bruch & Heimberg, 1994). General preoccupation with the public aspects of themselves has also been demonstrated in socially anxious subjects (McEwan & Devins, 1983; Smith, Ingram, & Brehm, 1983).

High public self-consciousness has been shown to be related to increased concern about receiving negative interpersonal feedback (Fenigstein, 1979) and increased sensitivity to rejection by a peer group (Fenigstein et al., 1975). Like social phobics, who have a tendency to self-attribute greater responsibility for social failure than for social success (Arkin, Appelman, & Burger, 1980; Hope & Heimberg, 1988; Girodo, Dotzenroth, & Stein, 1981), individuals high in public self-consciousness are more likely to take the blame for social rejection (Fenigstein, 1979; Fenigstein et al., 1975).

Goal/Ability Discrepancy and Social Anxiety

There is a long history in psychology of studying the effects of various forms of belief incompatibility. (e.g., Aronson, 1969; Epstein, 1980; Festinger, 1957). Theorists hypothesize that the holding of conflicting beliefs leads to negative emotional states (e.g., tension, pressure, conflict, stress). More recently, Higgins (1987) has proposed a theory which relates specific types of discrepant self-cognitions to specific emotional consequences. Self-discrepancy theory (Higgins, 1987) links emotional consequences such as dejection, fear, embarrassment, and shame to inconsistent beliefs about one's performance ("actual"), obligations ("oughts"), and aspirations ("ideals") from one's own perspective or from that of another. Mismatches can occur within the self-referenced domains (e.g., a discrepancy between one's ideal characteristic and the characteristics one feels obligated to achieve), or between the perspectives of self and other (e.g., conflicts between the one's personal ideal characteristics and the ideal characteristics one

believes another to expect from one). The forms of discrepancy are associated with differing emotional syndromes. Especially relevant to social anxiety are discrepancies between one's actual characteristics and those one believes another to expect of oneself (actual/own versus ought/other).

Higgins' theory holds that actual/own versus ought/other discrepancies are related to agitation-based emotions, such as anxiety. These types of discrepancies are thought by Higgins to result in feelings of fear and threat due to the anticipation (or actual presence) of negative outcomes. The fear of negative evaluation by others and the expectation of highly negative social reception, which are common features of social anxiety, can be viewed from this theory as a result of discrepancies between actual social performance and the social performance one believes another to expect from one.

A theory which can be easily viewed in concert with Higgins' theory is the self-presentation model of social phobia proposed by Schlenker and Leary (1982). The self-presentation model can combine many of the tenets of other models into a unified perspective (Leary, 1983). The Schlenker and Leary (1982) model postulates that social anxiety will occur when an individual is motivated to make a specific type of impression on another individual but doubts that he will be able to convey this impression successfully (an actual/ought discrepancy when viewed from Higgins' theory). Two interesting features of the self-presentation model are its ability to adapt to situations where an individual knows he will make a positive impression but expects it will not be positive enough for his wishes, and its applicability to situations

where an individual desires to make a negative or abnormal impression but is doubtful of his success (Leary & Kowalski, 1995). Within the framework of this theory, social anxiety (doubt over one's success in impression management) can occur for a number of reasons, including high drive for social approval, unfounded negative self-evaluation, perfectionistic expectations, deficient social skills, or a history of social failure. Thus, the proposed etiological variables highlighted in other models are viewed within the self-presentational framework as factors which would lead individuals to be highly invested in impression management, or doubtful of their ability to succeed in their desired impression. This mismatch of goal and ability has been proposed as a cause of self focussed attention, which has been frequently demonstrated in social phobia (Buss, 1986; Carver & Scheier, 1984; Trower & Turland 1984). Self-focus has, in turn, been linked to a reversal of the self-serving bias, which has been demonstrated in socially reticent individuals. The socially anxious are disposed to attribute social failure to themselves, and social success to external forces (Arkin, Appelman, & Burger, 1980). This internal attribution of failure leads to low expectancies of future social success, and therefore, to low motivation for social interaction and, possibly, decreased social performance (Anderson & Arnoult, 1985).

Despite the differences between social anxiety, shyness, embarrassment, etc. which are claimed by some researchers, a central theme in all of these disorders is an individual's belief that he or she is not able to perform up to his/her standard; a discrepancy between the performance goal and the perceived level of their ability

(Edelmann, 1984, 1985a; Schlenker & Leary, 1982). This hypothesis has been supported by a recent study indicating that socially reticent college students give highly discrepant ratings between their desired level of performance and the level of performance they believed they could achieve (Trower, Gilbert, & Sherling, 1990). Although seldom directly investigated, the possibility of a discrepancy between goal and perceived ability in social anxiety has received indirect support from a number of research domains, including self-efficacy, outcome expectancy, and social skills.

Self-efficacy

Social performance self-efficacy has been a difficult area to examine due to the initial conceptualization by Bandura of self-efficacy as a discrete, highly specific phenomenon (Bandura, 1977; Moe & Zeiss, 1982). In contrast, social performance/social skill has been defined through a large number of social skills (e.g., Hersen & Bellak, 1977). It is, therefore, difficult to limit the number of social skills examined while still obtaining an accurate representation of an individual's social performance repertoire (Moe & Zeiss, 1982). An additional difficulty is the conceptualization of self-efficacy as wholly separate from outcome expectancy (Bandura, 1977). Measuring maximal social performance without reference to reception by others is made difficult by the very definition of *social* behavior. Due to these measurement challenges, social performance self-efficacy has often been examined in an indirect fashion.

Although socially anxious individuals and normals describe using equivalent social behaviors, when dealing with difficult social situations, anxious individuals rate

themselves as less competent to deal with these situations than are others (Edelman, 1985b). Subjects in an investigation by Maddux, Norton, and Leary (1988), were asked to rate the self-efficacy and social anxiety they would experience in imaginal social situations. This investigation found self-efficacy to be negatively correlated with both situational and dispositional social anxiety. This inverse relationship of social anxiety and self-efficacy has been additionally documented by Barrios (1983), and also in research by Jennings (1985), where the statistical significance of the relationship remained even after the effects of seven related variables had been removed. Low self-efficacy has also been widely discussed in the shyness literature as a factor in the behavior of shy individuals (Brodt & Zimbardo, 1981; Campbell & Fairey, 1985; Cheek et al., 1986; Clark & Arkowitz, 1975; Paulhus & Martin, 1987; Schwartz & Gottman, 1976).

Low self-efficacy has been linked to the tendency of socially anxious individuals to withdraw from social situations (Carver, Antoni, & Scheier, 1985; Meyer, & Hokanson, 1985). Similarly, doubts about one's ability to perform socially have been linked to the failure to respond to social cues oft reported in shy individuals (Pilkonis, 1977; Zimbardo, 1977). Further support of the link between self-efficacy and social inaction is provided in studies showing that beliefs about oneself are capable of determining one's social behavior even in the presence of prominent social norms (Clark & Arkowitz, 1975; Harris, 1984; Hill, 1989; Lord & Zimbardo, 1985; Schutte, Kenrick, & Sadalla, 1985).

Outcome Expectancies

Leary and colleagues have linked social anxiety to low self-presentational outcome expectancies (Leary 1983, 1986; Leary, Barnes, Griebel, Mason, & McCormack, 1986; Leary, Knight, & Johnson, 1987). Individuals who are socially anxious are thought to have generally low expectations that correctly performed social behaviors will receive the desired response from others (Maddux, et al., 1988). The socially reticent have been shown to think more about their social performance outcome and to look for social cues indicating negative appraisal (Leary, 1986; Öhman & Dimberg, 1984). The excessive self-focus common in social phobia has been hypothesized to make individuals more aware of their possible social limitations, and to enhance the degree to which they believe others perceive these limitations (Bruch, Gorsky, Collins, & Berger, 1989; Trower & Kieley, 1983). Enhanced awareness of social limitations and the belief that the limitations are highly visible leads social phobics to expect a more negative perception by others (negative outcome) (McEwan & Devins, 1983). Evidence indicates that this population predicts, perceives, and recalls negative social appraisal to a higher degree than do nonanxious individuals (Carver & Scheier, 1981; Fenigstein, 1979; Halford & Foddy, 1982; Lucock & Salkovskis, 1988; Mathews & McLeod, 1987; Smith, Ingram & Brehm, 1983; O'Banion & Arkowitz, 1975).

Social skills

The social skills deficit model of social anxiety proposes that socially anxious individuals are anxious due to their realization that their social skills are lacking

(Bellack & Hersen, 1979; Curran, 1977). This hypothesis was initially supported by the decrease in anxiety often noted in patients following their receiving social skills training (Bander, Steinke, Allen & Mosher, 1975; Bellak & Hersen, 1979; Curran, 1977; Curran, Gilbert, & Little, 1976; Twentyman & McFall, 1975).

Unfortunately for the social skills deficit model, few studies have found demonstrable differences in the social skills evidenced by anxious and non-anxious individuals (Pilkonis, 1977b; Twentyman & McFall, 1975), whereas many more found no differences in social skills (e.g., Clark & Arkowitz, 1975; Glasgow & Arkowitz, 1975; Pilkonis, 1977b; Rapee & Lim, 1992). Although specific social skills were not found to be different, global judgements of the social ability of anxious and nonanxious subjects often did differ (Arkowitz, Lichtenstein, McGovern, & Hines, 1975; Beidel, Turner, & Dancu, 1985; Borkovec, Stone, O'Brien, & Kaloupek, 1974). Socially reticent people are typically given lower overall ratings by observers, probably due to their tendency to appear more anxious, awkward, and inhibited during interactions (Asendorpf, 1987, 1989; Cheek & Buss, 1981; Jones & Briggs, 1984; Pilkonis, 1977). Therefore, it is likely that socially anxious individuals possess the necessary social skills, but are inept in using them, or are prevented from using them due to their self-preoccupation and their anxiety about being socially evaluated (Asendorpf, 1987, 1989; Melchior & Cheek, 1990). This trend in the literature supports the hypothesis that the presence of an objective deficit is less important for the development of social anxiety than is the self-perception of a deficit (Rehm & Marston, 1968).

A second problem in the social skills literature is that of accurately assessing subjects' true social ability. Baumgardner and Brownlee (1987) found strategic failure to be more likely in socially anxious individuals when it would prevent others from developing high expectations for future performance. This strategic failure, presumably, occurs because the socially anxious individuals lacked expectations of continued efficacious performance (Baumgardner & Brownlee, 1987). There may, therefore, be a confound in some of the social skills literature between actual ability and possible deliberate self-handicapping.

Persons diagnosed with social phobia tend to be perfectionistic in their standards of personal behavior, and often judge their own performance to be unacceptable (Beidel, Turner, & Dancu, 1985; Dodge, Heimberg, Nyman, & O'Brien, 1987; Juster et al., in press cited in Leung, Brown, Heimberg, Frost, & Holt, 1995; Makris, et al., 1995 cited in Leung et al., 1995; Stopa & Clark, 1993; Trower & Turland, 1984). Those who are socially anxious evaluate standardized interpersonal feedback more negatively (Halford, 1979 cited in Halford & Foddy, 1982; Smith & Sarason, 1975;), they underestimate their degree of social skill (Caccioppo, Glass, & Merluzzi, 1979; Clarke & Arkowitz, 1975; Curran, Wallander, & Fischetti, 1980), and they magnify negative aspects of their performance and minimize positive performance characteristics (Clark & Arkowitz, 1975; Glasgow & Arkowitz, 1975; Rapee & Lim, 1992). Although highly anxious subjects attribute less skill to their own performance than do trained judges, they rate others' behavior accurately, further

magnifying negative evaluation of their own social performance (Rapee & Lim, 1992).

These unrealistically high standards and the belief in one's poor social skills have been proposed by Schlenker and Leary (1985) to automatically increase fear and doubt about one's social presentation. Rapee and Lim (1992) consider this doubt about one's social skills to be one of the keys to the maintenance of social phobia. This proposition is strengthened by evidence that reductions in social anxiety are often achieved by procedures designed to decrease excessively negative self-evaluations (Clark & Arkowitz, 1975; Kanter & Goldfried, 1979; Meichenbaum, et al., 1971; Sherman, et al., 1974). The cycle of anxiety and poor perceived social performance is further supported by findings from the shyness literature which suggest that although shy people are accurately identified by others as shy, they are never perceived as negatively as their self-ratings would suggest (Bruch, et al 1989; Depaulo, et al, 1987; Jones & Briggs, 1984).

Fear of Negative Evaluation and Social Anxiety

Fear of negative evaluation (FNE) is often cited as a central feature of social phobia, and a factor essential to social phobia's development (e.g., Butler, 1985; Rapee, 1995; Turner, et al., 1992). According to Beck's theory, fear of social evaluation is a result of social phobics' schematas, in which they define themselves as lacking in some important social characteristic (Hope, Rapee, Heimberg, & Dombeck, 1990). These suppositions are supported by evidence that social phobics engage in frequent rumination about the possibility of negative evaluation, and that

these negative thoughts are highly correlated with the degree of anxiety evidenced by social phobics (Dodge, Hope, Heimberg, & Becker, 1988; Rapee, 1995).

Individuals who are high in FNE are extremely concerned about how others perceive them, whether or not this perception will reflect on them personally (Gregorich, Kemple, & Leary, 1986). High FNE has also been related to the need to avoid disapproval and gain approval (Friend & Gilbert, 1973; Leary, 1980; Smith & Campbell, 1973; Watson & Friend, 1969). High FNE individuals are more likely to expect negative evaluation, they view evaluative feedback as less positive, they are more affected by negative evaluation, and they are more likely to behave in ways believed to decrease their chance of negative evaluation (Friend & Gilbert, 1973; Smith & Campbell, 1973; Smith & Sarason, 1975). In the absence of information rating another's performance, individuals with high FNE are likely to assume that the other person performed more proficiently than did they (Gregorich et al., 1986). Finally, high FNE has been associated with greater motivation to make a good impression, and with greater interpersonal anxiety (Leary, 1983a, 1983b).

Since FNE has been demonstrated to be associated with interpersonal anxiety, it is not surprising that social phobics have, in numerous studies, been shown to have elevated indices of FNE when compared to subjects with other disorders or non-disordered controls (Heimberg, Hope, Rapee, & Bruch, 1988). Fear of social evaluation also differentiates shy and non-shy subjects (Asendorpf, 1987). Finally, change in FNE is believed to be the best predictor of treatment success in social phobics (Mattick & Peters, 1988; Mattick, Peters, & Clarke, 1989; Hope et al., 1990).

Lucas & Telch, 1993). Because fear of negative evaluation is such a central part of social anxiety, it will be, for purposes of this study, considered to be an integrated aspect of social fear.

PURPOSE

The current study had several general goals. Firstly, the present study drew etiological variables from the related literatures of social anxiety, social phobia, and shyness. In so doing, it was hoped that the recent move toward conceptualizing these syndromes as a spectrum of disorders, rather than discrete phenomena, would be advanced. It was also hoped that the proposed etiological model would aid the efforts to enhance scientific understanding across the divisions of literature. Secondly, the current study was designed to examine the structure of several constructs frequently used in the social anxiety, shyness, and social phobia literatures. This examination of constructs was seen as an opportunity to advance the psychometric properties of commonly used scales. Thirdly, because the examination of social phobia and social anxiety has only recently gained popularity, this area of study has no unified theory of causation. It was hoped that the present study would begin the process of model building to guide the development of future research questions.

The immediate purpose of the current study was to examine the factors of *family environment, negative peer interactions, neuroticism, attractiveness, public self-consciousness, goal ability discrepancy, and fear of negative evaluation* within the framework of a structural equation model of the etiology of social anxiety. The model depicted in Figure 1 was derived from the literature reviewed above. The model had four exogenous variables and three endogenous variables. (For purposes

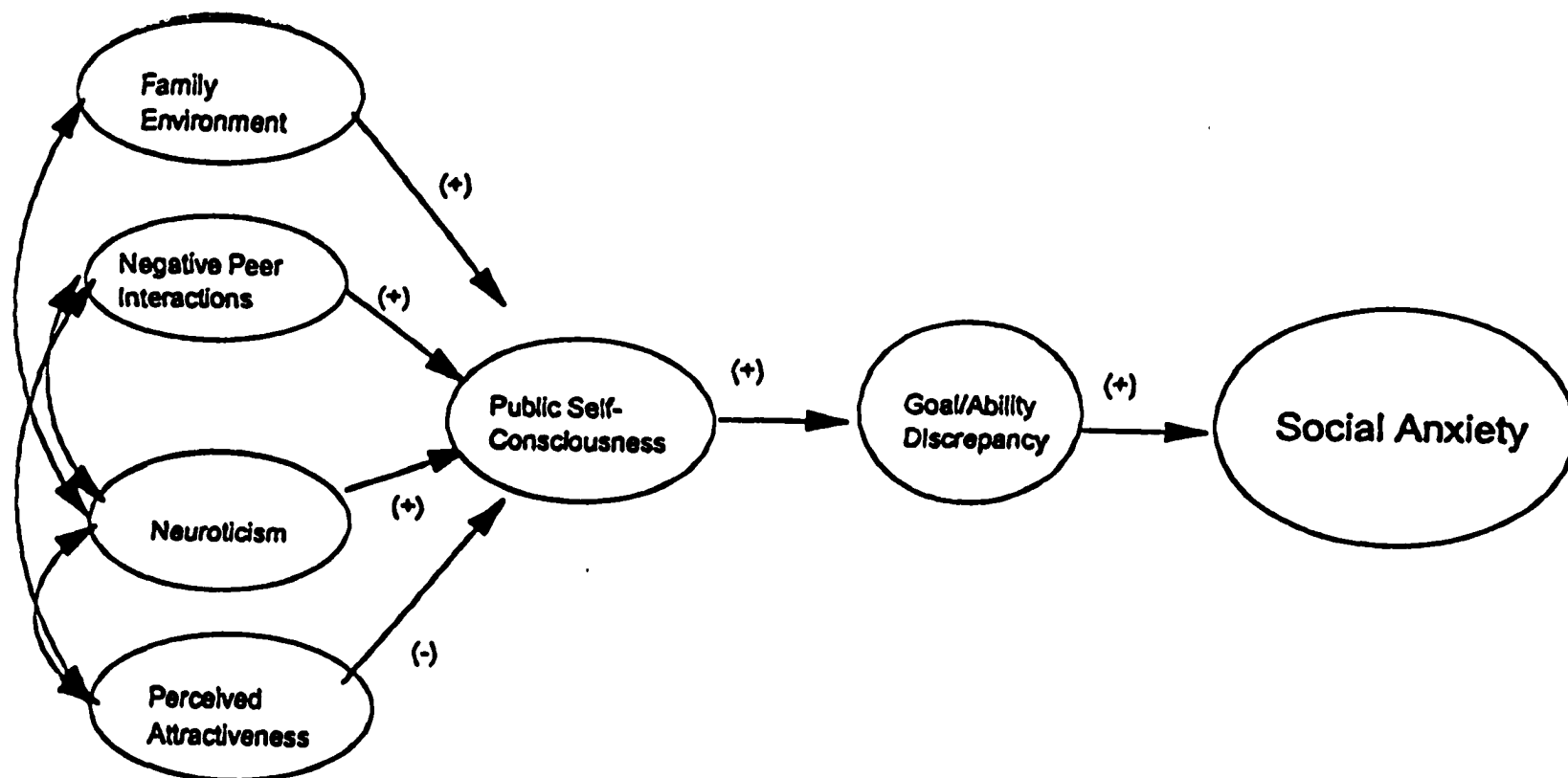


Figure 1. Etiological model of social anxiety.

of structural equation modeling, *exogenous variables* refer to those variables which are thought to be caused by variables outside the specified structural model. *Endogenous* variables refer to those variables whose causation is specified within the present structural model.) The exogenous variables in the current study were *family environment* (overprotective/rejecting parenting styles, increased parental emphasis on the opinions of others, family insularity/low sociability, parental anxiety), *negative peer interactions* (peer neglect/peer rejection), *neuroticism*, and *attractiveness* (self-perceived current attractiveness, self-perceived childhood attractiveness, and self-perceived adolescent attractiveness). The endogenous variables were *public self-consciousness* and social behavior *goal ability discrepancy*. *Fear of negative evaluation* was considered to be an integral portion of *social anxiety*, and therefore was combined with the social anxiety construct for purposes of this model. This model was tested using structural equation modeling (SEM).

Predicted paths included a positive path from *goal ability discrepancy* to *social anxiety* and a positive path from *public self-consciousness* to *goal ability discrepancy*. Several indirect antecedents of social anxiety were also proposed. It was hypothesized that a positive path existed from *family environment* to *public self-consciousness*. Positive paths were also predicted from *negative peer interactions* to *public self-consciousness*, and from *neuroticism* to *public self-consciousness*. A negative path was predicted from *attractiveness* to *public self-consciousness*. Although there exists the possibility that some of these variables were reciprocally causative, this type of relationship may not be tested within the limitations of structural equation modeling.

The directionality of these constructs were, therefore, determined by temporal relationship and by preexistent theory, where available.

The three phases of this investigation focused on (1) examining the factor structures, reliabilities, and intercorrelations of the exogenous constructs, examining the initial performance of the structural model, and proposing alternate models, (2) examining the interrelationships of the constructs and testing the fit of the structural models, and (3) cross-validation of the best-fitting structural models in an independent sample.

Factors Not Included in the Model

The following variables were considered for inclusion in the model, but were discarded due to insufficient evidence:

Family Cohesion

Although decreased family cohesion has been identified by Plomin and colleagues (Daniels & Plomin, 1985, Plomin & Daniels, 1986, Plomin & DeFries, 1983, 1985) as relating to increases in children's shyness, this variable has not been examined in subsequent literature. Because this factor does not have substantial support in the social phobia or shyness literature, its effects were not included in this study.

View Others as Threatening/Powerful Others

As previously noted, Buss' (1980, 1986) theory of the etiology of social anxiety postulates that excessive parental focus on the opinions of others during childhood could lead to fear of negative evaluation. Although not widely studied, recent evidence

indicates that socially anxious individuals may believe others are more powerful than do normals or panic disordered individuals (Cloitre, Heimberg, Holt, & Liebowitz, 1992). This decreased belief in internal control of social interactions is similar to findings described in Leary and Atherton (1986) which suggest that socially anxious individuals are pessimistic about others' goodwill towards them, and doubt that socially skilled behavior will influence other's opinions. Although this may be seen as simply an extension of the social phobic's negative outcome expectancy, Jones, Briggs, and Smith (1986) provide further evidence for this other-distrust. These authors used factor analysis to examine five shyness scales. It was found that 3 distinct factors emerged: distress in social situations, social poise, and fear of high status others. Despite this promising start, little additional inquiry into the possibility of socially anxious individuals viewing others as threatening. Because of the sparsity of evidence, this factor was not included in the current model, but warrants future study.

Birth Order

A child's ordinal position in the family has been proposed by Zimbardo (1977) to be an etiological factor in the developmental of shyness. Examining survey data, Zimbardo noted a trend for greater self-reported shyness among single and first-born children. There are many possible interpretations of this data including the theory that parents expectations for first-borns and only children may be higher. First-born children may be, therefore, more likely to judge themselves as inadequate. Later-born children may also become more adept at social interactions because they are born at a power disadvantage to older siblings and arrive into a family which already includes

models for their behavior. Unpublished research summarized by Asendorpf (1986) lends some support to a birth-order effect in that shyness was found to be greatest in only children, followed in order by first-borns, middle-borns, and last-borns. No other empirical studies have addressed the influence of ordinal birth position on social reticence, therefore, evidence for this factor was not great enough for its inclusion.

Sociability

The interaction of social reticence and low sociability has been examined in depth by Cheek and Buss (1981). These authors proposed that sociability may mediate the relationship of shyness and its behavioral correlates, and they suggested that different behavioral patterns may result from shy-low-sociables as opposed to shy-high sociables. Their hypotheses were moderately supported in their initial study, and moderate correlations between shyness and low sociability have been found in additional research (Bruch et al. 1986; Cheek & Buss, 1981; Jones Briggs, & Smith 1986; Phillips & Bruch, 1988). However, a more recent structural equation modeling analysis conducted by Bruch and colleagues (Bruch et al., 1989) failed to confirm the role of sociability as a mediator in the shyness/behavior relationship. In addition, other authors have theorized that sociability may be a result of social anxiety in that high anxiety resulting from interactions could decrease an individual's desire to affiliate (Leary, 1986).

Conditioning

Discrete traumatic conditioning experiences, although related to specific social phobia, show little relationship to generalized social phobia, which typically has an

insidious onset (Stemberger, et al., 1995). Traumatic conditioning experiences have not been shown to differentiate generalized social phobics from non-disordered controls. Since the focus of the current research was on generalized social anxiety, discrete traumatic conditioning was not included as a factor, although the effects of chronic negative social interactions can be considered to lie within the *negative peer interaction* factor.

METHOD

Subjects

Subjects were 559 volunteer undergraduate students drawn from the Louisiana State University psychology department subject pool. Subjects were given extra credit for participation which was applied to their psychology course grades. Extra credit was commensurate with time of participation (approximately 2 hours). Informed consent was obtained from all subjects prior to participation. Copies of the consent form can be found in Appendix A. Demographic characteristics of all three samples are provided in Table 1. Participants in Phases Two and Three of this study ranged in age from 19 to 69 years of age. The sample was primarily Caucasian (82.8%- Phases 2 and 3; 76% Phase 1), and was weighted in favor of females (67.8%).

Participants in Phase One completed the study approximately 3 months before those in Phases Two and Three, which were conducted at the same time. Phase 2 subjects (n=150) were randomly selected from the total Phase 2 and 3 sample.

Procedures

Phase One

Phase one subjects (n=100) were asked to complete the questionnaires described under Method-Phases Two and Three, and the questions listed in Appendices B, C, and D. These measures were administered in group format. Following administration of the assessment measures, subjects were debriefed about the purpose of the study and any questions or concerns were addressed. The pilot data were used

Table 1.
Demographic characteristics for samples one, two, and three.

	Phase 1 (n=100)	Phase 2 (n=150)	Phase 3 (n=309)
AGE			
Mean (S.D.)	NA*	21.89 (6.19)	21.49 (4.05)
GENDER			
Male		44 (29.3%)	81 (26.2%)
Female	NA*	103 (68.7%)	208 (67.3%)
Missing		3 (2%)	20 (6.5%)
ETHNICITY			
Caucasian	76 (76%)	135 (90%)	244 (79%)
African-American	11 (11%)	9 (6%)	29 (9.4%)
Hispanic	3 (3%)	2 (1.3%)	12 (3.9%)
Asian	6 (6%)	1 (0.7%)	15 (4.9%)
Other	4 (4%)	3 (2%)	9 (2.8%)

* Note: Some demographic characteristics of the Phase 1 sample are not available due to confusion over the instructions.

to establish the intercorrelations of the exogenous variables, to investigate the factor structures of the exogenous variables (especially the *family environment* construct) using LISREL (Jöreskog & Sörbom, 1993), and to examine the initial properties of the structural equation model in order to propose alternative models. Correlations between exogenous variables and the *public self-consciousness* construct were also investigated. This information was used to more fully specify the hypothesized structural model.

Phases Two and Three

Subjects (n=150, 309) were asked to complete the questionnaires described below. Additionally, subjects were asked to respond in writing to questions designed to measure demographic variables and the constructs of *negative peer interactions* and *perceived attractiveness* (see Appendices B, C, and D). Initial operationalization of constructs is depicted in Figure 2 and described in Table 2. All questions and questionnaires were administered in a large group format. Following completion of the assessment measures, subjects were debriefed and given an opportunity to address any concerns they might have had about the experimental procedure.

Questionnaires

Parent Attitudes Toward Child-Rearing Scale. The Parent Attitudes Toward Child-Rearing Scale (PACR) is a measure developed by Bruch and colleagues (Bruch, Heimberg, Berger, & Collins, 1989) to assess the perceptions

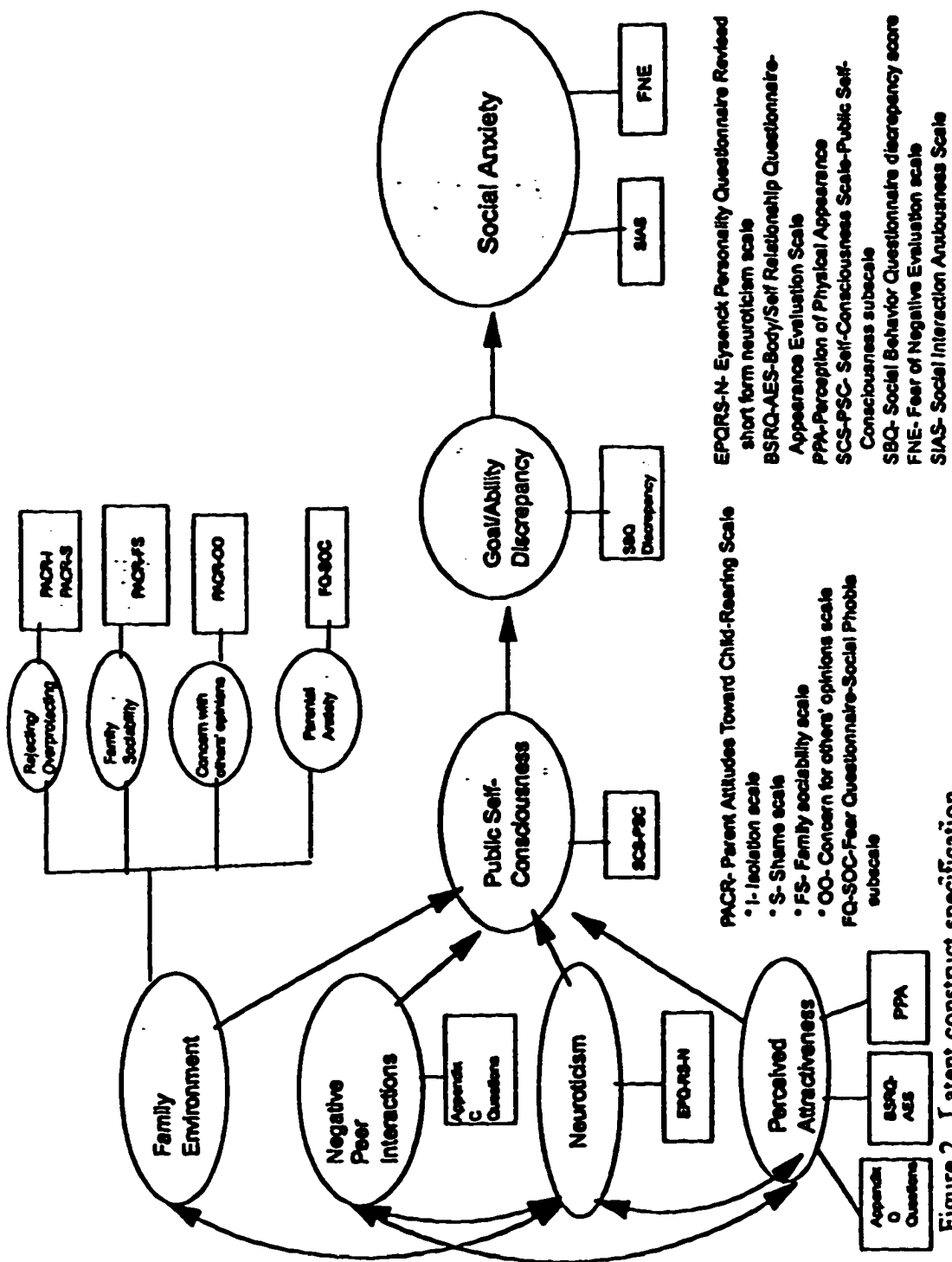


Figure 2. Latent construct specification.

Table 2.
Initial operationalization of constructs.

Construct	Measure
Family Environment	Parent Attitudes Toward Child Rearing Scale Fear Questionnaire-Social Phobia subscale
Negative Peer Interactions	Peer Interaction Questions (Appendix C)
Neuroticism	Eysenck Personality Questionnaire Revised (short form)- Neuroticism Scale
Perceived Attractiveness	Questions (Appendix D) Body-Self Relations Questionnaire- Physical Appearance Evaluation Subscale Perception of Physical Appearance Scale
Public Self-Consciousness	Self-Consciousness Scale-Public Self-Consciousness subscale
Goal/Ability Discrepancy	Social Behavior Questionnaire-Self-Actual/Other-Ought Discrepancy score
Social Anxiety	Social Interaction Anxiousness Scale Fear of Negative Evaluation Questionnaire

individuals have of their parent's child-rearing behaviors. The PACR consists of four subscales: Isolation, Concern with other people's opinions, Family sociability, and Shame. The isolation and concern with other's opinions scales were adapted from the Parental Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979) and the Children's Report of Parental Behavior (Schaefer, 1965). The third scale was derived through factor analysis of the Family Attitude Survey (Bloom, 1985). The shame scale was developed by the measure's authors prior to the Bruch et al. (1989) study. The isolation and shame scales are thought to be conceptually similar to the concepts of overprotectiveness and rejection identified in older social anxiety research and were, therefore, used to operationalize these concepts (e.g., Bruch & Heimberg, 1994). The concern with other's opinions scale was used to measure the concept of parental focus on the opinions of others, and the family sociability scale was employed to measure the degree to which family socialization was encouraged.

The PACR has 19 items, each of which subjects are asked to rate on a 1-5 scale (1=not at all characteristic; 5=very characteristic) as to the degree to which the item describes the subject's parents while they were living in the home. Total scores are then calculated for each scale, with three of the items receiving reverse scoring. The 5-item isolation scale (PACR-IS; e.g., "Even when I got older my parents didn't like me going out unless it was a special occasion") has been reported to have reliabilities of .80 and .71 in Bruch et al. (1989) and Bruch and Heimberg (1994), respectively, but achieved only a .59 reliability in the Leung et al. (1994) study. The concern with other people's opinions scale (PACR-OO) also has five items (e.g., My

parents placed importance on how it would look to other people if I didn't do well in school"), and coefficient α s were .71 in Bruch et al. (1989), .64 in Leung et al. (1994), and .68 in Bruch and Heimberg (1994). The reliabilities of the 4-item family sociability scale (PACR-FS; e.g., "My parents enjoyed taking the family to visit other people") were .86 and .75 in the Bruch et al. (1989) and Bruch and Heimberg (1994) studies, and .69 in the Leung et al. (1994) study. The shame subscale (PACR-SH) has five items, and was used in the Bruch and Heimberg (1994) and Leung et al. (1994) studies only. This subscale consists of items such as "I remember saying or doing something foolish at a family gathering and having one of my parents ridicule me in front of other people," and was reported by Bruch and Heimberg (1994) to have a coefficient α of .75, and by Leung et al. (1994) to have a reliability of .84.

A recent principal components factor analysis of the PACR (Leung et al., 1994) identified two factors accounting for 81% of the scale's variance. The first factor, Psychological Control, included the concern with other's opinions scale and the shame scale. The Behavioral Control factor was comprised of the family sociability and isolation scales. In the Leung et al. (1994) study, social anxiety was most highly related to the Psychological Control factor. In light of these results, the pilot investigation of the current study examined the factor structure of the PACR using LISREL (Jöreskog & Sörbom, 1993).

Fear Questionnaire (social phobia subscale). The Fear Questionnaire-social phobia subscale (FQ-soc; Marks & Mathews, 1979) was used in a manner consistent with Bruch et al. (1989) to have subjects assess the degree of anxiety and

avoidance displayed by each of their parents during the subject's childhood. The FQ-soc consists of five social situations (e.g., "Eating or drinking with other people") which are rated on a scale of 0 (would not avoid or feel fearful) to 5 (avoid always if possible). Responses to each situation are summed to provide a total score. The FQ has been evaluated with numerous diagnostic groups and has been found to be an accurate gauge of social phobic severity (Cottreaux, Bouvard, & Messy, 1987; Cox, Swinson, & Shaw, 1991). The FQ-soc has been consistently shown to have moderate internal reliability (Arrindell, Emmelkamp, & Van der Ende, 1984; Marks & Mathews, 1979; Oei, Moylan, & Evans, 1991) and will differentiate social phobics from sufferers of other anxiety disorders (Cox et al., 1991; Oei, Moylan, & Evans, 1991). Its validity for purposes of describing another's behavior has not been directly examined. In the current study, the scores for mother's anxiety and father's anxiety were averaged.

Negative peer interactions. As no standardized questionnaire for the measurement of peer neglect/rejection was available, the questions in Appendix C were employed to operationalize this construct. Research on childhood peer neglect typically uses the procedure of peer nomination ("Name the children you like most," "Name the children you like least") to determine social status (e.g., Coie & Kupersmidt, 1983; Asher, Markell, & Hymel, 1981; Lahey, Green, & Forehand, 1980). As adults are no longer in the social environments of childhood, this technique is not possible with retrospective research. Therefore, the questions in Appendix C were constructed in an attempt to gauge the degree to which subjects were neglected/ignored and/or harassed/rejected during childhood. Data from the pilot investigation were used

to examine the structure of the Appendix C questions. Those questions forming a distinct factor were used in Phases Two and Three as the measure of peer neglect/rejection. (Revisions to measures will be discussed in the Results section of this manuscript).

Eysenck Personality Questionnaire-Revised short form Neuroticism Scale. The short form of the Neuroticism scale of the Eysenck Personality Questionnaire-Revised (EPQR-S; Eysenck, & Barrett, 1985) was used in the current study to measure neuroticism. The EPQR and EPQ (EPQ; Eysenck & Eysenck, 1975) are refined versions of the Eysenck Personality Inventory (EPI; Eysenck & Eysenck, 1964). The EPI and the original EPQ have been compared extensively and have been found to intercorrelate adequately (e.g., Campbell & Heller, 1987; Campbell & Reynolds, 1982; Pearson, 1979), and the neuroticism scales of the two measures are considered to be interchangeable (Eysenck & Eysenck, 1975). The high correlations ($r > .95$) between the EPQ neuroticism scale and the 12-item neuroticism scale of the EPQR-S indicates that these scales are probably also functionally equivalent (Francis & Katz, 1992; Francis, Philipchalk, & Brown, 1991).

The EPQR-S neuroticism scale consists of 12 yes/no items such as "Are you an irritable person?". Subjects are given one point for each item they answer in the "yes" direction. Internal consistency estimates of the neuroticism scale of the EPQ are typically above .80 (e.g., Eysenck & Eysenck, 1975; Goh, King, & King, 1982). Test-retest reliability of the EPQ neuroticism scale ranges from .74 to .92 ($M = .86$; Eysenck & Eysenck, 1975). Because greater length typically improves reliability (Gulliksen,

1950; Lord & Novick, 1968), it is not surprising that the EPQR-short form scales are slightly less reliable than the extended measures ($r=.80-.84$; Eysenck, Eysenck, & Barret, 1985). Concurrent validity of the Eysenck scales has been supported through comparisons of self-report and other-report of personality characteristics. Moderate to high correlations have been found for self and other ratings employing the Eysenck neuroticism scales (Francis, Brown, & Philipchalk, 1992; Heath, Neale, Kessler, Eaves, & Kendler, 1992; White & Nias, 1994).

Physical appearance self-perception. In addition to the questions listed in Appendix D and the questionnaire discussed below, the Physical Vanity measure of Perception of Physical Appearance will be employed to measure subjects' perceptions of their attractiveness (Netemeyer, Burton, & Lichtenstein, 1995). This measure is composed of 5 items (e.g., "People notice how attractive I am") which are rated on a 1 (strongly disagree) to 7 (strongly agree) scale. The internal consistency estimate of this scale is .93 and evidence for the scale's validity can be found in Netemeyer et al. (1995).

Body/Self Relations Questionnaire- Physical Appearance Evaluation subscale.

The Appearance Evaluation subscale of the Winstead and Cash (1984) Body/Self Relations Questionnaire (BSRQ-PAE) was employed, along with the measure described above and the Appendix D questions, to operationalize subject's perceptions of their physical attractiveness. This measure consists of 7 items (e.g., "I like my looks just the way they are") which are rated on a scale of 1 (definitely disagree) to 7 (definitely agree). Two items are reverse scored. The BSRQ-PAE has

been reported to have an internal consistency reliability estimate of .89, a three-week test-retest reliability estimate of .89, and a wealth of evidence supports the measure's validity (e.g., Noles, Cash, & Winstead, 1985; Brown, Cash, & Mikulka, 1990; Cash & Brown, 1989; Cash & Green, 1986; Jackson, Sullivan, & Rostker, 1988).

Public Self-Consciousness Scale. The Public Self-Consciousness Scale (PSC) is derived from the Self-Consciousness Scale (SCS; Fenigstein, Scheier, & Buss, 1975). The original version of the SCS has been used extensively in research (see Buss, 1980; Carver & Scheier, 1981; Scheier & Carver, 1983 for reviews), and discriminant validity of the measure has been supported in a number of studies (e.g., Carver & Glass, 1976; Turner, Scheier, Carver, & Ickes, 1978).

The version of the PSC scale used in the current investigation was derived from the general adult form of the SCS designed by Scheier and Carver (1985; Appendix J). Scheier and Carver endeavored to make the questionnaire's format less confusing and decrease the vocabulary level necessary for full understanding of the items. The seven items on the revised (general adult) PSC subscale (e.g., "I'm concerned about my style of doing things") are rated by subjects on a 0 (not at all like me) to 3 (a lot like me) scale. The factor structure of the original and revised scales are highly similar, and the two scales correlate at .84. The internal consistency reliability of the revised PSC scale is .84, and 4-week test-retest correlation for the PSC scale was .74. The comparability of the two versions of the SCS suggests that validity evidence for the original measure would be similarly applicable to the revised measure.

Social Behavior Questionnaire. The Social Behavior Questionnaire (SBQ-versions SA and OO; Appendices E and F) was developed for the current research. This measure consists of 18 difficult social situations. Subjects rate their perception of their actual behavior (version SA) and the behavior they believe a significant other expects of them (version OO) on 7-point scales which are behaviorally referenced (specific behaviors are described to anchor scale midpoint and endpoints). Individuals' responses are summed to provide two separate total scores. In addition, the sum of the absolute value of the differences between SBQ-SA responses and SBQ-OO responses can be used as a measure of obligated or desired behavior/actual behavior discrepancy (*goal/ability discrepancy*).

Internal consistency reliability of the SBQ-SA and the SBQ-OO were .87 and .92, respectively. Two week test-retest stability of the measures is adequate (SBQ-SA $r=.88$, $p<.01$; SBQ-OO $r=.75$, $p<.01$). The temporal stability of the SBQ-SA/OO discrepancy score was also adequate ($r=.79$, $p<.01$). Moderate negative correlations were obtained between the SBQ-SA and the FNE and the State-Trait Anxiety Inventory-Trait (STAI-T; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). A low, significant, negative correlation is also present between the SBQ-SA and the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The SBQ-SA/OO discrepancy score is also significantly related to the FNE, BDI, and STAI-T.

Fear of Negative Evaluation Scale. The Fear of Negative Evaluation Scale (FNE) was developed by Watson and Friend (1969), and is one of the

most widely used measures in the social anxiety/shyness literature. The 30-item true false FNE scale measures the expectation of negative appraisal by others. The reliability and stability of the FNE are adequate (FNE KR-20 $r=.94$, FNE test-retest $r=.68$; Watson & Friend, 1969). Individuals high in FNE have been demonstrated to work harder for social approval and feel worse about negative evaluation (Watson & Friend, 1969; Smith & Sarason, 1975), they prefer to avoid social comparison and symmetrical relationships (Friend & Gilbert, 1973; Smith & Campbell, 1973), and they are more invested in positive social judgement (Leary, 1980). Although the validity of the FNE for use in social anxiety/social phobia research has been widely demonstrated (e.g., Arkowitz, Lichtenstein, McGovern, & Hines, 1975; Friend & Gilbert, 1973; Gelernter, Uhde, Cimboic, Arnkoff, Vittone, Tancer, & Bartko, 1992; Heimberg, Hope, Rapee, & Bruch, 1988), its ability to discriminate social phobia from other anxiety disorders is hotly debated (Heimberg et al., 1988; Turner, McCanna, & Beidel, 1987). The FNE's usefulness as a predictor of treatment outcome (Holt, Heimberg, & Hope, 1990; Mattick & Peters, 1988) and its extensive history of use in research argue against the abandonment of this measures.

Recently an abbreviated version of the FNE has been constructed (Leary, 1983b). Twelve highly loading items from the original FNE scale were chosen to comprise the abbreviated version, and the response format was changed to a 5-point scale. For each item (e.g., "I am afraid that others will find fault with me"), respondents are asked to rate the degree to which the item is characteristic of them. Ratings range from 0 ("not at all") to 4 ("extremely"). Four items are reverse scored.

The original and abbreviated FNE forms were found to correlate at $r=.96$. Cronbach's alpha for the Brief-FNE was .90, and four week test-retest reliability was .75. These values are similar to the psychometrics reported by Watson and Friend (1969) for the original scale. Initial validity data provided by Leary (1983b) appears to support the use of the Brief-FNE as a substitute for the original measure, therefore, the shorter scale will be employed in the current investigation. Because fear of negative evaluation is considered, for purposes of this investigation, a central aspect of social anxiety, the FNE scale will be combined with the Social Interaction Anxiousness Scale to operationalize *social anxiety*.

Social Interaction Anxiousness Scale. The Social Interaction Anxiousness Scale (SIAS) is a measure developed by Mattick and Clark (1989; Heimberg et al., 1992) to be used in the assessment of social phobia. The 20-item SIAS is designed to measure anxiety in social situations (contingent interactions, e.g., "I have difficulty talking with other people"). The scale was initially developed on social phobic patients, however, validation data was collected using both patient and nonpatient samples. The SIAS is rated on a 5 point scale from 0 (not at all characteristic of me) to 4 (extremely characteristic or true of me). Three items on the SIAS are reverse scored. Cronbach's alphas for the SIAS have ranged from .85 to .93 in a variety of samples (Heimberg, Mueller, Holt, Hope, & Liebowitz, 1992; Mattick & Clark, 1989). High test-retest correlations ($r=.90$ and above) were reported by Mattick and Clark for 3-13 weeks. Scores of social phobics on the SIAS have been shown to be higher than scores of nondisordered controls or other patient groups, and

social phobics can be accurately categorized using this measure (Heimberg et al., 1992; Mattick & Clark, 1989). In addition, the SIAS is highly correlated with other measures of social anxiety (Heimberg et al., 1992), and studies by Mattick and colleagues have demonstrated the SIAS to be sensitive to treatment changes (Mattick & Peters, 1988; Mattick, Peters, & Clark, 1989).

DATA ANALYSIS

Structural Equation Modeling

The hypothesized model of etiological factors for the development of social anxiety was tested using structural equation modeling with the LISREL VIII program (Jöreskog & Sörbom, 1993). Structural equation modeling (SEM), also called covariance structure analysis, is a statistical procedure designed to allow the testing of the plausibility of theoretical models using correlational and nonexperimental data (Bentler, 1980; Fassinger, 1987).

Central in the procedure of SEM is the specification of a theoretical structure between latent variables (see Figure 1; Bentler, 1980; Fassinger, 1987). These specified relationships are then tested for fit in a specific population through the use of observable indicator variables (the measures previously described, see Figure 2 and Table 2). A full structural equation model, the type advocated in the SEM literature, includes two components (Anderson & Gerbing, 1988; Bagozzi & Heatherton, 1994). The first step is the *measurement model* (Phase Two of the current investigation), which examines the relationship between the latent constructs and the indicator variables via confirmatory factor analysis. The psychometric properties of the multiple item scales/measures used as indicator variables are examined through estimation of the dimensionality, internal consistency, and discriminative validity of the measures. This separate examination of the measurement component allows psychometric deficiencies to be identified prior to the estimation of the theoretical portion of the model. Because of the measurement model, SEM avoids the assumption of error-free measurement.

which is its primary advantage over path analysis, where indicator variables are assumed to perfectly measure the underlying construct (Fassinger, 1987). Because of the large number of items included in the measures of the present study, however, a full measurement model was not estimated. Instead, the properties of the measures were examined in Phase One (pilot investigation). Like in a measurement model, Phase One was used to examine the reliability of the measures, the discriminant validity between measures, and the error associated with each measure. For the remainder of the phases (examining the structural model), the sum of the items in each measure were used to operationalize the constructs for the model. In order to incorporate random measurement error into the model, the measurement loading of each construct was fixed to the square root of its coefficient alpha, and the error loading to one minus alpha (Bagozzi & Heatherton, 1994; Jöreskog & Sörbom, 1982; Kenny, 1979).

After the measurement properties of the indicator variables were established and fixed, the *structural model* was assessed (Bentler, 1980; Fassinger, 1987). Correlation matrices were used to transform the sample data. These matrices were then described by a set of regression equations. The hypothesized relationships between the latent variables were then analyzed for "goodness of fit" for the population from which the data was collected. For the present study, model parameters and fit statistics from the pilot investigation were used to modify the etiological model and to propose an alternative model. These models were then tested in samples two and three. The performance of the models was evaluated by goodness-of-fit, individual

path significance, and estimates of variance in the endogenous variables explained by their respective structural paths.

Fit statistics were used to evaluate the goodness-of-fit between the specified model and the sample data. Goodness-of-fit is determined by comparison of the population covariance (correlation) matrix which would be predicted by the estimated model with the actual covariance (correlation) matrix computed from the sample data. It must be remembered, when contemplating measures of fit, that models with fewer degrees of freedom (i.e., those with fewer observable indicators) will obtain a greater degree of fit than those with greater degrees of freedom, regardless of the degree to which constructs correlate (James, Muliak, & Brett, 1982; Fornell, 1986). The widely used goodness-of-fit indices described below were employed in the current study.

Chi-square (Bollen, 1989)

Chi-square is an index of absolute fit between the covariances implied by the fixed parameters specified in the model and the observed covariances. A significant Chi-square statistic rejects the null hypothesis that a model is adequately described by the data. Lower values (towards zero) are associated with more optimal fit, while increasing values indicate a greater discrepancy between observed and implied covariances (Hoyle & Panter, 1995). Distortion by sample size and sensitivity to violations of the normality assumption are weaknesses of the Chi-square statistic (Marsh, Balla, & McDonald, 1988). As such, chi-square is used as a guide and not an absolute measure of model fit (Bollen, 1989).

Goodness-of-Fit Index (GFI)/Adjusted Goodness-of-Fit Index (AGFI; Jöreskog & Sörbom, 1981)

The GFI is a ratio of the amount of the observed variance and covariance accounted for by the proposed model (sums of squares) to the sums of squares of the estimated population variance and covariance (Bruch, Gorsky, Collins, & Berger, 1989; Jöreskog & Sörbom, 1981). The GFI is only moderately associated with sample size (Marsh et al., 1988). The AGFI uses mean squares rather than total sums of squares, and is more sensitive to additional model parameters (Marsh et al., 1988). Although the relationship of the GFI and AGFI is linear, the performance of the AGFI has been suggested to be less than adequate due to overcorrection by the penalty function. The ranges of GFI and AGFI are interpreted in a manner similar to correlation coefficients, therefore, values closer to 1 are more desirable (Fassinger, 1987).

Tucker-Lewis Index (TLI; Tucker & Lewis, 1973)

The TLI, which is also called the non-normed fit index, is an incremental fit index which estimates the relative improvement of a proposed model over the independence ("null") model (Hoyle & Panter, 1995). Of goodness-of-fit indices, the TLI has been found to be the least affected by large sample size, however, it has been suggested by Hu and Bentler (1993 cited in Hoyle & Panter, 1995) to be downwardly biased with the use of the sample sizes typical in psychological research (those less than 1,000). TLIs of .90 and above are generally regarded as indicating adequate fit (Bentler, 1990; Bollen, 1989).

Comparative Fit Index (CFI; Bentler, 1990)

The CFI is a Type-3 incremental fit index which gauges the reduction in lack of fit by the target model compared to a baseline model (Hoyle & Panter, 1995). The CFI ranges from 0 to 1 and, although absolute standards of good fit are not certain, .90 and above is generally accepted as indicating adequate fit (Bentler, 1990; Bollen, 1989). Bentler (1990) notes that the CFI is a fit measures which is robust to the effects of small sample size.

RESULTS

Phase One (Pilot Investigation)

For the initial portion of this study, LISREL (Jöreskog & Sörbom, 1993) confirmatory factor analyses were used to modify the structures of several of the constructs employed in this study. Constructs whose structures were questioned prior to the study were the *family environment*, *negative peer interactions*, and *perceived attractiveness* constructs. The scales operationalizing the *neuroticism* and *public self-consciousness* constructs were also examined for coherence due to their history of substantial modification over the period of their use. All other constructs employed in the study were examined using confirmatory factor analysis, but were not modified. (Means and standard deviations for standard and revised measures in all samples can be found in Appendix G). Correlations among standard measures (for all three samples) can be found in Appendices H, I, and J. The modification of each revised construct is discussed separately below.

Family Environment

The *family environment* construct was initially conceptualized as a higher-order construct comprised of the factors rejecting/overprotecting parenting, family sociability, concern with others' opinion, and parental anxiety (see Figure 2, upper left corner). The rejecting/overprotecting factor was operationalized by a combination of the PACR-IS and PACR-SH scales. The family sociability factor was operationalized by the PACR-FS scale and the concern with others' opinions scale was measured using the PACR-OO scale. Parental anxiety was operationalized using the mean of

participants' responses on the mother and father versions of the Fear Questionnaire (FQ-Mother, FQ-Father, FQ-PAR).

Using confirmatory factor analysis, the preliminary fit of the five scales was first examined independently. That is, a one-factor model was estimated for each individual scale. Each scale was found to be a coherent grouping of items (GFI ranged from .95 to .99; AGFI ranged from .83 to .98; TLI ranged from .85 to 1.18; and CFI ranged from .93 to .99). Internal consistency reliability was found to be relatively low, possibly due to the low numbers of items in the scales (Cronbach's alphas ranged from .57 to .82). Examination of the correlations among these scales indicated that, consistent with recent research (e.g., Leung et al., 1994), the PACR's IS and FS scales and the OO and SH scales were highly correlated (for more information see Appendix H). These scale combinations were then examined for structural integrity.

The combined IS/FS scale showed very poor internal consistency ($\alpha = .48$, 9 items), therefore, the decision was made to allow these scales to remain as independent, but correlated, structures. The combined OO/SH scale achieved low but acceptable internal consistency ($\alpha = .79$, 10 items). This scale was then examined using confirmatory factor analysis. This scale was found to fit marginally with the Phase One data (GFI=.89, AGFI=.83, TLI=.84, CFI=.88), however, two items failed to have significant t-values. A decision was made to trim the scales by deleting the two problematic items. Removal of the two non-significant items resulted in a scale with improved fit to the collected data (GFI=.93, AGFI=.88, TLI=.93, CFI=.95). This

revised version of the OO/SH scale also evidenced improved internal consistency reliability ($\alpha=.81$). Correlation of the 8-item OO/SH scale with the 10-item OO/SH scale was high ($r=.98$), indicating that research conducted with the revised measure can be viewed as an extension of research employing the original measure.

The higher-order *family environment* factor, consisting of the PACR-IS, PACR-FS, PACR-OO/SH, and FQ-PAR, was examined. Because of the large number of items, total scores were used to designate these factors. The tested *family environment* construct was found to have less than optimal fit with the observed data. Although GFI was within the acceptable range ($GFI=.94$), AGFI, TLI, and CFI were somewhat low ($AGFI=.67$, $TLI=.64$, $CFI=.87$). All factors within this model achieved significant t-scores ($p<.05$). Coefficient alpha and composite alpha for this measure were lower than desired at .69 and .65, respectively. Variance extracted for this factor was within the desired range at .51, and coefficient of determination was .67. Future analyses will employ a summed total score made up of combined factor scores to operationalize this construct. (A summary of internal consistency information for all revised scales in sample one is provided in Table 3.)

Negative Peer Interactions

Because the peer interaction questions were fashioned from a review of the peer/neglect rejection literature, the cohesiveness of the questions was not known prior to the pilot investigation. The performance of these questions as a unitary scale was examined using internal consistency reliability analysis and confirmatory factor

Table 3.
Measurement statistics for sample one (revised measures).

Construct	FIT INDICES						INTERNAL CONSISTENCY		
	df	χ^2	GFI	AGFI	TLI	CFI	Comp. α	Coeff. α	AVE
Family Environment	2	15.21	.94	.67	.64	.87	.65	.69	.51
Negative Peer Interactions	5	9.26	.97	.89	.96	.98	.88	.87	.59
Perceived Attractiveness	2	3.24	.98	.92	.98	1.0	.82	.80	.54
Neuroticism	27	65.16	.87	.78	.76	.82	.80	.80	.32
Public Self-Consciousness	9	18.64	.94	.86	.70	.82	.57	.61	.22
Goal/Ability Discrepancy	135	237.00	.81	.75	.99	.99	.89	.88	.32
Social Anxiety	464	1296.00	.46	.38	.60	.63	.92	.91	.32

Note: df= degrees of freedom; Comp. α = composite alpha; Coeff. α = coefficient alpha; AVE= average variance extracted.

analysis. The 6-item scale obtained a coefficient alpha of .88, however, fit of the scale was less than desirable (GFI=.78, AGFI=.49, TLI=.60, CFI=.76). Modification indices were employed to trim one item from the scale (printed in **bold** in Appendix C). This deletion improved the fit of the scale markedly (GFI=.97, AGFI=.89, TLI=.96, CFI=.98) and changed the scale's internal consistency reliability only slightly ($\alpha=.87$). Correlation of the total score of the original seven items with the total score comprised of the remaining six was excellent ($r=.99$). T-values for all items remaining in the scale were significant ($p<.05$). Composite alpha for this measure was .88. Variance extracted for this factor was within the desired range at .59, and coefficient of determination was .88. The sum of the revised 5-item negative peer interactions scale was employed to operationalize the *negative peer interactions* construct in all further analyses.

Perceived Attractiveness

Three measures were initially chosen as possible indicators of *perceived attractiveness* (Appendix D questions, BSRQ-PAE, PPA). The Appendix D questions were derived from previous social anxiety studies. The other two measures had not previously been used in the examination of social anxiety. Through this pilot examination, it was found that the two standard measures were only moderately related to the questions derived from the social anxiety literature. (The Appendix D questions correlated with the BSRQ-PAE at $r=.40$, and with the PPA at $r=.32$). It was, therefore, decided that the Appendix D questions would stand alone as the measure of *perceived attractiveness*. Cronbach's alpha for the 4-item scale

was .80, and confirmatory factor analysis revealed a good fit of this unitary factor structure to the phase one data (GFI=.98; AGFI=.92, TLI=.98, CFI=1.0). All items in the scale had significant t-values ($p < .05$). Composite alpha for this measure was .82. Variance extracted for this factor was within the desired range at .54, and coefficient of determination was .99. A total score derived from the Appendix D questions was used in all further analyses as the operationalization of the *perceived attractiveness* construct.

Neuroticism

The 12-item EPQR-s was subjected to structural examination. These 12 items achieved a less than desirable fit with the observed data (GFI=.82, AGFI=.74, TLI=.67, CFI=.73). In an attempt to achieve the most cohesive scale possible, modification indices were employed to increase the fit of the model. Three items were trimmed from the scale in order to improve the scale's fit, resulting in a significant reduction in Chi-square ($\chi^2 (27)=64.30$; $p < .01$). The revised scale's fit with the observed data was slightly improved, but was still low (GFI=.87; AGFI=.78, TLI=.76, CFI=.82). The modification of the scale lowered the internal reliability of the scale slightly (12-item scale $\alpha = .81$; 9 item-scale $\alpha = .80$). All items retained in the 9-item scale achieved significant ($p < .05$) t-values. Correlation of the 12-item scale with the 9-item scale was .89, indicating that research conducted with the standard scale is probably applicable to the revised version. Composite alpha for this measure was .80. Variance extracted for this factor was lower than desired at .32, however,

the coefficient of determination for this scale was acceptable at .88. The sum of the 9-item scale was used in all subsequent analyses to operationalize the construct *neuroticism*.

Public Self-Consciousness

The structure of the Self-Consciousness Scale-Public Self-Consciousness subscale was examined using confirmatory factor analysis. The standard scale achieved a less than optimal fit with the Phase One data (GFI=.92; AGFI=.83, TLI=.57, CFI=.71). Examination of the t-values for each item revealed that one item did not reach significance at the .05 level. This led to the removal of the problematic item, resulting in a significant reduction in Chi-square ($\chi^2 (3)=13.62$; $p<.01$), but only slightly improved fit statistics (GFI=.94; AGFI=.86, TLI=.70, CFI=.82). Cronbach's alpha changed only slightly, lowering from .62 for the standard model to .61 with the revised model. T-scores for all items remaining in the scale were significant at the $p<.05$ level. In keeping with the rather low coefficient alpha for this measure, composite alpha for this measure was only .57. Variance extracted for this factor was also lower than desired at .22, and the coefficient of determination for this scale was likewise low at .66. Due to the research tradition of this scale, however, it was retained as the operationalization of the *public self-consciousness* construct.

Revisions to standard measures are summarized in Table 4, and the revised operationalization of constructs to be used in further analyses has been summarized in

Table 4.
Revisions to standard measures following sample one analyses.

Scale	Items Retained (total)	Fit of Standard Measure (GFI)	Items Deleted	Fit of Revised Measure (GFI)	Coefficient Alpha Standard Measure	Coefficient Alpha Revised Measure	Correlation Standard Measure-Revised Measure
PACR-OOSH	8	.89	9,3	.93	.79	.81	.98
PEER	5	.78	5	.97	.88	.87	.99
EPQR-S	9	.82	1,6,7	.87	.81	.80	.89
SCS-PSC	6	.92	7	.94	.62	.61	.98

Table 5. Means and standard deviations for standard and revised measures are contained Appendix G, and their intercorrelations in sample one are found in Table 6.

Tests of discriminant validity were performed on these revised constructs. Correlations among these constructs ranged from .001 to .46, and all of these estimates were significantly less than “1.0.” The ϕ estimates among these scales ranged from .00 to .48, again all significantly less than “1.0.” Finally, for any pair of constructs, the average VE between the two constructs was greater than ϕ^2 . These procedures support the discriminant validity of the constructs (Anderson & Gerbing, 1988; Fornell & Larcker, 1981).

Following the revised operationalization of constructs, the hypothesized model of etiological factors for the development of social anxiety (Figure 1) was tested using structural equation modeling with the LISREL VIII program (Jöreskog & Sörbom, 1993), employing correlation matrices due to the use of total scores in operationalization. Given the small to moderate sample sizes across studies, the problems associated with models with a large number of observable indicators, and the focus on the relationships among constructs, each measure’s Cronbach’s alpha level was used to estimate measurement error (i.e., 1 minus alpha) in the structural equations (Hoyle & Panter, 1995; James et al., 1982). The measurement loading of each construct was fixed to the square root of its coefficient alpha (see Table 7). Although this procedure has been questioned as not adequately considering measure

Table 5.
Revised operationalization of constructs.

Construct	Measure
Family Environment	Parent Attitudes Toward Child Rearing Scale-Isolation subscale Parent Attitudes Toward Child Rearing Scale-Family Sociability subscale Parent Attitudes Toward Child Rearing Scale-Shame/Others' Opinions subscale (minus items 3 & 9) Fear Questionnaire-Social Phobia subscale
Negative Peer Interactions	Peer Interaction Questions (Appendix C- minus question 5)
Neuroticism	Eysenck Personality Questionnaire Revised (short form)-Neuroticism Scale (minus items 1, 6, & 7)
Perceived Attractiveness	Attractiveness Questions (Appendix D)
Public Self-Consciousness	Self-Consciousness Scale-Public Self-Consciousness subscale (minus item 7)
Goal/Ability Discrepancy	Social Behavior Questionnaire-Self-Actual/Other-Ought Discrepancy score
Social Anxiety	Fear of Negative Evaluation Questionnaire Social Interaction Anxiousness Scale

Table 6.
Correlations among revised measures for phase one sample.

	FAMENV	PEER-r	EPQR-Ss	ATTR	PSC-r	G-A DISCREP	SOCANX
FAMENV	1.00						
PEER-r	.17	1.00					
EPQR-Ss	.32**	.38**	1.00				
ATTR	.001	.36**	.32**	1.00			
PSC-r	.26**	.09	.33**	.16	1.00		
G-A DISCREP	.22*	.31**	.46**	.19	.25*	1.00	
SOCANX	.20	.34**	.30**	.10	.24*	.32**	1.00

Note: Sample one n=100.

FAMENV= Family environment composite variable (Parental Attitudes Toward Child Rearing scale plus Fear Questionnaire-Parents' average)

PEER-r= Negative peer interactions-revised questions

EPQR-Ss= Eysenck Personality Questionnaire-RS- shortened version

ATTR=Perceived attractiveness questions

PSC-r= Public Self Consciousness Scale-revised version

G-A DISCREP= Goal-ability discrepancy

SOCANX= Social anxiety composite variable (Fear of Negative Evaluation Scale plus Social Interaction Anxiousness Scale)

** Correlations significant at $p < .01$

* Correlations significant at $p < .05$

Table 7.

Cronbach's alpha, error term, and factor loading for each construct in samples one, two, and three.

	Sample One α	Sample One Error	Sample One Loading	Sample Two α	Sample Two Error	Sample Two Loading	Sample Three α	Sample Three Error	Sample Three Loading
SOCANX	.91	.95	.09	.85	.15	.92	.89	.11	.94
FAMENV	.69	.83	.31	.70	.30	.84	.72	.28	.85
PEER	.87	.93	.13	.88	.12	.94	.91	.09	.95
NEUROT	.80	.89	.20	.65	.35	.81	.74	.26	.86
ATTR	.80	.89	.20	.87	.13	.93	.82	.18	.91
PSC	.61	.78	.39	.59	.41	.77	.66	.34	.81
G-A DISC	.88	.94	.12	.86	.14	.93	.85	.15	.92

Note: SOCANX= Social anxiety composite variable (Fear of Negative Evaluation

Scale plus Social Interaction Anxiousness Scale)

FAMENV= Family environment composite variable (Parental Attitudes
Toward Child Rearing scale plus Fear Questionnaire-Parents' average)

PEER= Negative peer interactions-revised questions

NEUROT= Eysenck Personality Questionnaire-RS- shortened version

ATTR=Perceived attractiveness questions

PSC-r= Public Self Consciousness Scale-revised version

G-A DISCREP= Goal-ability discrepancy

dimensionality, it does allow for the incorporation of the effects of random measurement error on path estimates between constructs.

Evaluating the Structural Model-Phase One

Structural models test the relationships between independent (exogenous) and dependent (endogenous) variables, by simultaneously estimating and evaluating the standardized regression equations (paths) describing their relationships. The structural model takes measurement error into account. The examination of both direct and indirect effects is permitted in structural modeling, as are directional predictions.

As previously described, a number of indices may be employed to test the adequacy of a proposed model in describing the collected data. The fit indices used in this study were Chi-square, the Goodness-of-fit Index (GFI), the Adjusted Goodness-of-fit Index (AGFI), the Tucker-Lewis Index (TLI), and the Comparative Fit Index (CFI). Given these indices tend to be higher with fewer observable variables, the significance of individual paths among latent variables and the amount of variance explained in the dependent variables will also be used to assess model appropriateness. In addition, LISREL-produced modification indices will be employed during Phase One to make revisions in the present model and to propose an alternative model of social anxiety.

Goodness-of-fit indices for the initial theoretical model of the etiology of social anxiety (Model 1) are presented in Table 8 (Sample one n=100). This model yielded a significant Chi-square (a nonsignificant Chi-square indicates that a model is adequately described by the data). A GFI of .93 and an AGFI of .79 were also

Table 8.
Structural model results: Models 1 and 2.

FIT INDICES							
	df	χ^2	GFI	AGFI	TLI	CFI	RMR
Model 1							
Sample 1	9	26.91	.93	.79	.54	.80	.10
Model 2							
Sample 1	8	12.67	.97	.89	.86	.95	.07
Sample 2	8	81.54	.89	.61	.16	.68	.11
COMPLETELY STANDARDIZED PATH ESTIMATES							
PATH	Model 1 Sample 1		Model 2 Sample 1		Model 2 Sample 2		
Family Environment → Public Self-Consciousness	γ_{11}	.26 *	γ_{11}	.27*		.04	
Family Environment → Goal-Ability Discrepancy							
Negative Peer Interactions → Public Self-Consciousness	γ_{12}	-.10	γ_{12}	-.16		-.30**	
Neuroticism → Public Self-Consciousness	γ_{13}	.48 **	γ_{13}	.38*		.55**	
Perceived Attractiveness → Public Self-Consciousness	γ_{14}	.13	γ_{14}	.15		.11	
Neuroticism → Goal-Ability Discrepancy			γ_{23}	.53 **		.71**	
						(table con'd)	

PATH	Model 1 Sample 1		Model 2 Sample 1		Model 2 Sample 2
Public Self-Consciousness → Goal-Ability Discrepancy	β_{21}	.49**	β_{21}	.09	-.07
Goal-Ability Discrepancy → Social Anxiety	β_{32}	.37**	β_{32}	.37**	.61**
Family Environment → Negative Peer Interactions	ϕ_{12}	.22*	ϕ_{12}	.22*	.49**
Family Environment → Neuroticism	ϕ_{13}	.43**	ϕ_{13}	.43**	.23**
Family Environment → Perceived Attractiveness	ϕ_{14}	.00	ϕ_{14}	.00	.23**
Negative Peer Interactions → Neuroticism	ϕ_{23}	.45**	ϕ_{23}	.45**	.36**
Negative Peer Interactions → Perceived Attractiveness	ϕ_{24}	.43**	ϕ_{24}	.43**	.50**
Neuroticism → Perceived Attractiveness	ϕ_{34}	.40**	ϕ_{34}	.40**	.40**
Public Self-Consciousness (R^2)		.41		.30	.31
Goal-Ability Discrepancy (R^2)		.24		.33	.45
Social Anxiety (R^2)		.13		.14	.37

Note:: Sample one n=100; Sample two n=150; Model 1= Originally hypothesized model (see Figure 1); Model 2= Model 1 with additional path from *neuroticism* to *goal-ability discrepancy* (see Figure 4); df=degrees of freedom; GFI=Goodness-of-Fit Index; AGFI= Adjusted Goodness-of-Fit Index; TLI= Tucker-Lewis Index (non-normed fit index); CFI=Bentler's Comparative Fit Index; RMR= Root Mean Square Residual.

** Signifies paths significant at $p < .05$ * Signifies paths approaching significance

achieved by this model. The TLI and CFI, which are both based on comparison between the tested model and a null model and which are affected by sample size to a lesser degree than the GFI and AGFI, were .54 and .80, respectively. (It should be noted that the TLI imposes a penalty for increasing numbers of paths being estimated.) The path estimates and correlations between exogenous variables for this model are presented in Figure 3 and in Table 8. Path estimates achieving significance were the path to *public self-consciousness* from *neuroticism* (γ_{13}), the path to *goal-ability discrepancy* from *public self-consciousness* (β_{21}), and the path to *social anxiety* from *goal-ability discrepancy* (β_{32}). In addition, the path to *public self-consciousness* from *family environment* (γ_{11}) approached, but did not reach, the .05 level of significance. As evidenced in Figure 3 and Table 8, four of six intercorrelations among exogenous variables were significant at the .05 level. Forty-one percent of the total variance in *public self-consciousness* was accounted for by the exogenous variables, twenty-four percent of the variance in *goal-ability discrepancy* was accounted for by *public self-consciousness*, and thirteen percent of the variance in *social anxiety* was accounted for by *goal-ability discrepancy*.

Modification indices indicated that an additional estimated path to *goal-ability discrepancy* from *neuroticism* (γ_{23}) would improve the fit of the model to the data. Because this change was not counter to theory, the additional path was estimated in Model 2 (see Figure 4). The goodness-of-fit indices for this model, which are presented in Table 8, indicated an improved fit of the model to the data. This model

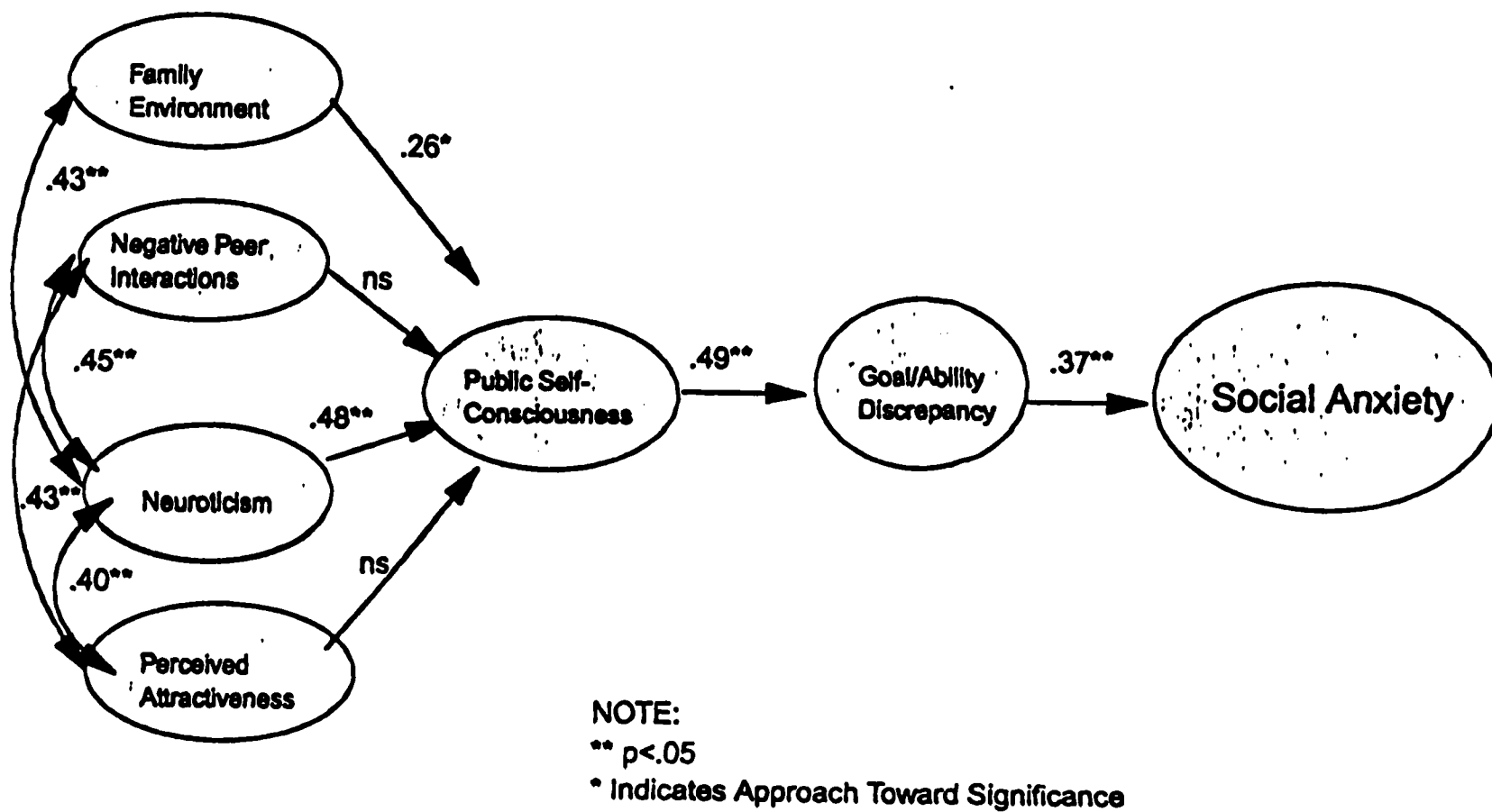


Figure 3. Results of model one tested in sample one.

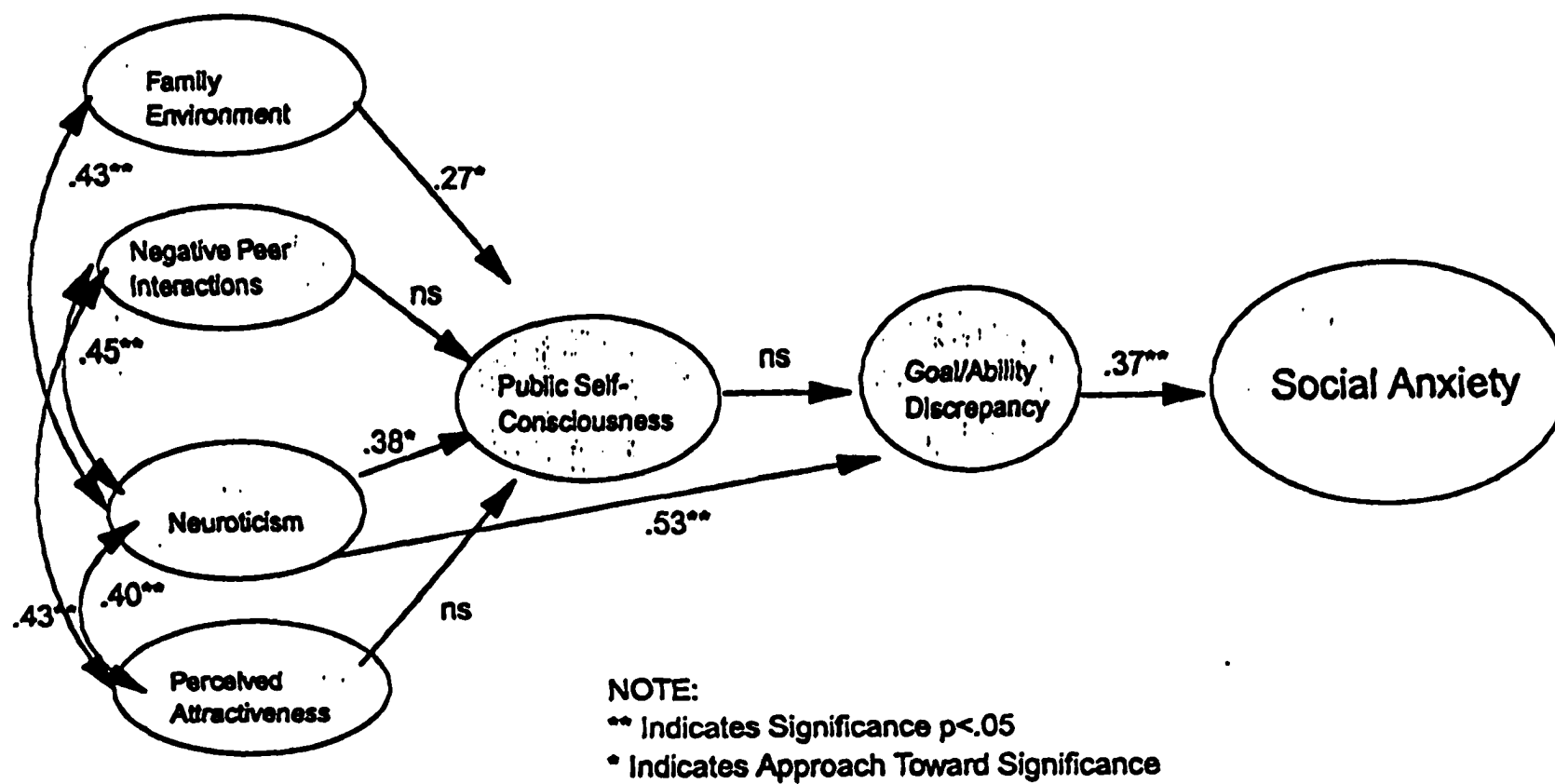


Figure 4. Results of model two tested in sample one.

yielded a nonsignificant Chi-square value, with a GFI of .97, and AGFI of .89, a TLI of .86, and a CFI of .95. The newly estimated path (γ_{23}) was significant, as was the path to *social anxiety* from *goal-ability discrepancy* (β_{32}). Approaching significance were the path to *public self-consciousness* from *neuroticism* (γ_{13}) and the path to *public self-consciousness* from *family environment* (γ_{11}). The path to *goal-ability discrepancy* from *public self-consciousness* (β_{21}) was no longer significant in this model. In this model, thirty percent of the variance in *public self-consciousness* was accounted for by the exogenous variables, thirty-three percent of the variance in *goal-ability discrepancy* was accounted for by paths leading to it, and *goal-ability discrepancy* accounted for fourteen percent of the variance in *social anxiety*.

Although fit indices for Model 2 were acceptable, other theoretical explanations of the pattern of results could also be made. Because the relationships between many of the variables had not been firmly established in previous investigations, an alternative model of social anxiety was fashioned for examination (see Figure 5). Model 3 employed three endogenous constructs (*family environment*, *neuroticism*, and *public self-consciousness*) and one mediating endogenous construct (*goal-ability discrepancy*) in the modeling of social anxiety's etiology. Goodness-of-fit indices and path estimates for Model 3 are presented in Table 9. This model also achieved a nonsignificant Chi-square and excellent overall fit estimates (GFI=.99, AGFI=.95, TLI=1.03, CFI=1.00). Endogenous variables in Model 3 accounted for thirty-one percent of the variance in *goal-ability discrepancy* and it, along with a

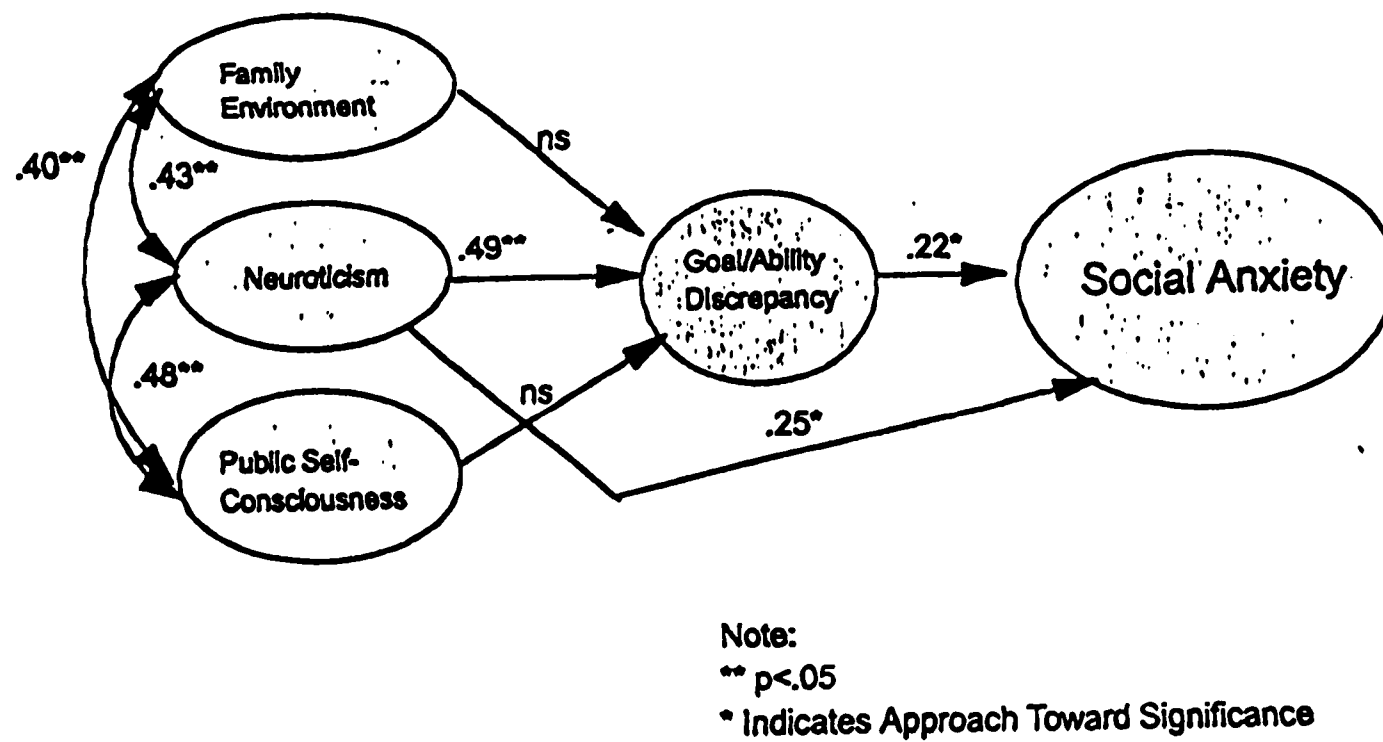


Figure 5. Results of model three tested in sample 1.

Table 9.
Structural model results: Model 3.

FIT INDICES							
	df	χ^2	GFI	AGFI	TLI	CFI	RMR
Model 3							
Sample 1	2	1.70	.99	.95	1.03	1.00	.03
Sample 2	2	7.14	.98	.87	.82	.96	.03
Sample 3	2	20.57	.97	.80	.71	.94	.04

COMPLETELY STANDARDIZED PATH ESTIMATES				
Path		Sample 1	Sample 2	Sample 3
Family Environment → Goal-Ability Discrepancy	γ_{11}	.04	-.16*	-.01
Neuroticism → Social Anxiety	γ_{22}	.25*	.87**	.52**
Neuroticism → Goal-Ability Discrepancy	γ_{12}	.49**	.66**	.29**
Public Self-Consciousness → Goal-Ability Discrepancy	γ_{13}	.09	-.02	.31**
Goal-Ability Discrepancy → Social Anxiety	β_{21}	.22*	.03	.37**
Family Environment → Neuroticism	ϕ_{12}	.43**	.37**	.42**
Family Environment → Public Self-Consciousness	ϕ_{13}	.40**	.04	.27**

(table con'd)

Path		Sample 1	Sample 2	Sample 3
Neuroticism → Public Self-Consciousness	ϕ_{23}	.48**	.43**	.57**
Goal-Ability Discrepancy (R^2)		.31	.37	.28
Social Anxiety (R^2)		.17	.79	.59

Note: Sample one n=100; Sample two n=150; Sample 3 n=309

Model 3= Alternate etiological model of social anxiety, including FAMENV (see Figure 5).

df=degrees of freedom; GFI=Goodness-of-Fit Index; AGFI= Adjusted Goodness-of-Fit Index; TLI= Tucker-Lewis Index (nonnormed fit index); CFI=Bentler's Comparative Fit Index; RMR= Root Mean Square Residual.

** Signifies paths significant at $p < .05$

* Signifies paths approaching significance

direct path from *neuroticism*, accounted for seventeen percent of the variance in *social anxiety*. In this model, only the path to *goal-ability discrepancy* from *neuroticism* was significant (γ_{12}). The path to *social anxiety* from *goal-ability discrepancy* (β_{21}) and the path to *social anxiety* from *neuroticism* (γ_{22}) approached significance.

Chi-square difference tests were conducted to determine if there were statistically significant differences in the fit of the models. Adding a path to *goal-ability discrepancy* from *neuroticism* significantly improved the fit of Model 2 as compared to Model 1 ($\chi^2(1)=14.24$; $p<.01$). Based on the large reduction in chi-square, decreased root mean square residual, and improved fit statistics, Model 3 also appeared to be superior to Model 1 in its ability to be described by the Phase One data. The differences between Model 2 and Model 3 in fit were not great enough to discount either model from further examination. Therefore, it was decided that both Model 2 and Model 3 would be tested in the data from sample two.

Evaluating the Structural Model-Phase Two

Because of their good performance in the sample one data, Model 2 (revised model of social anxiety) and Model 3 (alternate model of social anxiety) were cross-validated using sample two data ($n=150$). (A summary of internal consistency information for all revised scales in sample two is provided in Table 10. Intercorrelations among revised measures are provided in Table 11.) Goodness-of-fit indices for the two models are presented in Tables 8 and 9. Model 2 resulted in a significant Chi-square, a GFI of .89, an AGFI of .61, a TLI of .16, and a CFI of .68.

Table 10.
Measurement statistics for sample two (revised measures).

Construct	FIT INDICES					INTERNAL CONSISTENCY			
	df	χ^2	GFI	AGFI	TLI	CFI	Comp. α	Coeff. α	AVE
Family Environment	2	11.68	.96	.82	.81	.94	.76	.70	.46
Negative Peer Interactions	5	7.78	.98	.94	.99	1.0	.88	.88	.61
Perceived Attractiveness	2	9.64	.97	.84	.93	.98	.87	.87	.64
Neuroticism	27	81.24	.89	.81	.67	.75	.72	.65	.24
Public Self-Consciousness	9	21.61	.95	.89	.75	.85	.61	.59	.23
Goal/Ability Discrepancy	135	273.12	.84	.79	.77	.80	.87	.86	.27
Social Anxiety	464	1092.65	.59	.54	.64	.66	.92	.85	.28

Note: df= degrees of freedom; Comp. α = composite alpha; Coeff. α = coefficient alpha; AVE= average variance extracted.

Table 11.
Correlations among revised measures for phase two sample.

	FAMENV	PEER-r	EPQR-Ss	ATTR	PSC-r	G-A DISCREP	SOCANX
FAMENV	1.00						
PEER-r	.39**	1.00					
EPQR-Ss	.17*	.24**	1.00				
ATTR	.18*	.43**	.27**	1.00			
PSC-r	.03	.01	.29**	.14	1.00		
G-A DISCREP	.07	.27**	.43**	.27**	.19**	1.00	
SOCANX	.34**	.47**	.63**	.34**	.26**	.47**	1.00

Note: N=150

FAMENV= Family environment composite variable (Parental Attitudes

Toward Child Rearing scale plus Fear Questionnaire-Parents' average)

PEER-r= Negative peer interactions-revised questions

EPQR-Ss= Eysenck Personality Questionnaire-RS- shortened version

ATTR=Perceived attractiveness questions

PSC-r= Public Self Consciousness Scale-revised version

G-A DISCREP= Goal-ability discrepancy

SOCANX= Social anxiety composite variable (Fear of Negative Evaluation
Scale plus Social Interaction Anxiousness Scale)

** Correlations significant at $p < .01$

* Correlations significant at $p < .05$

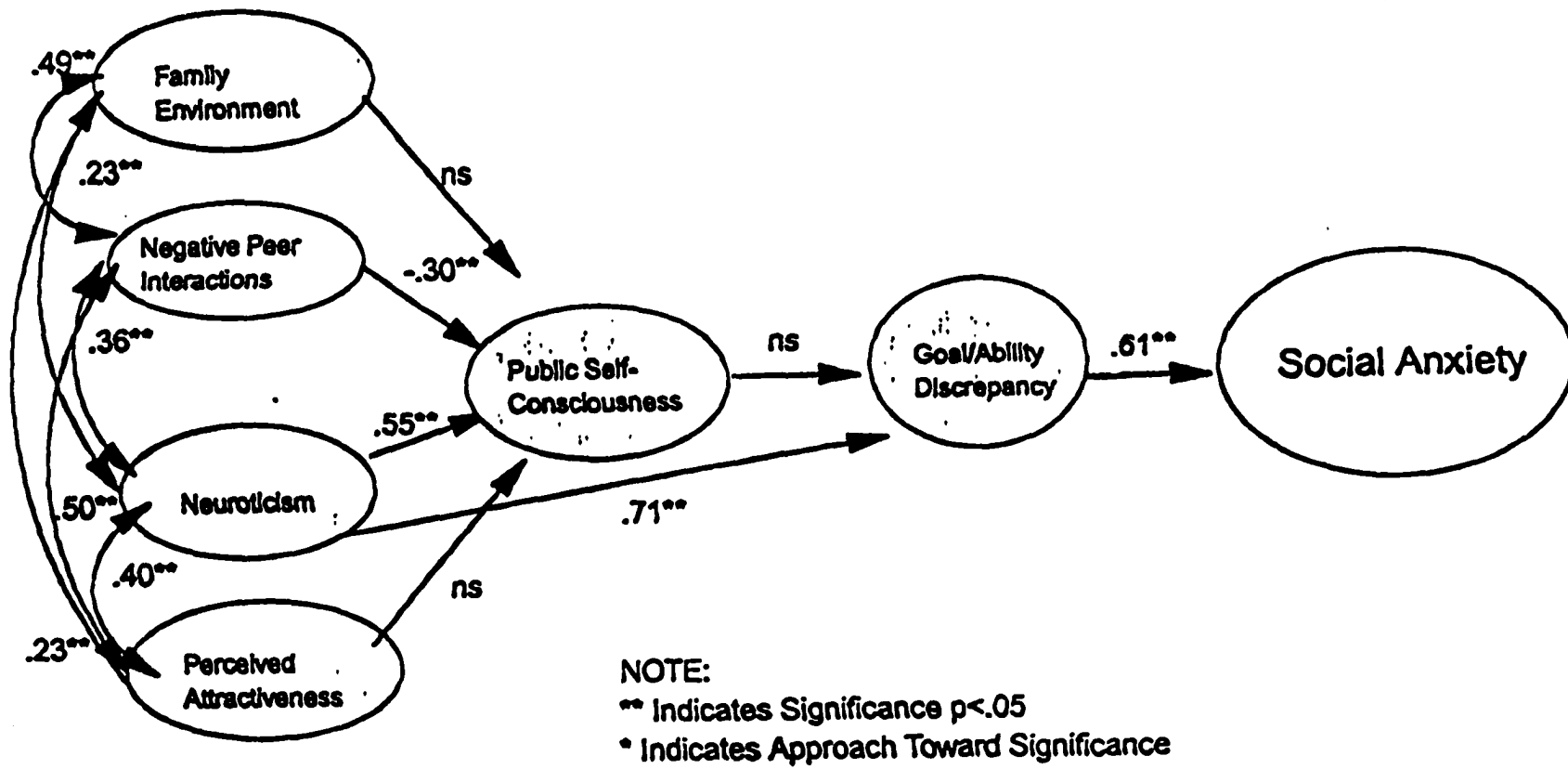
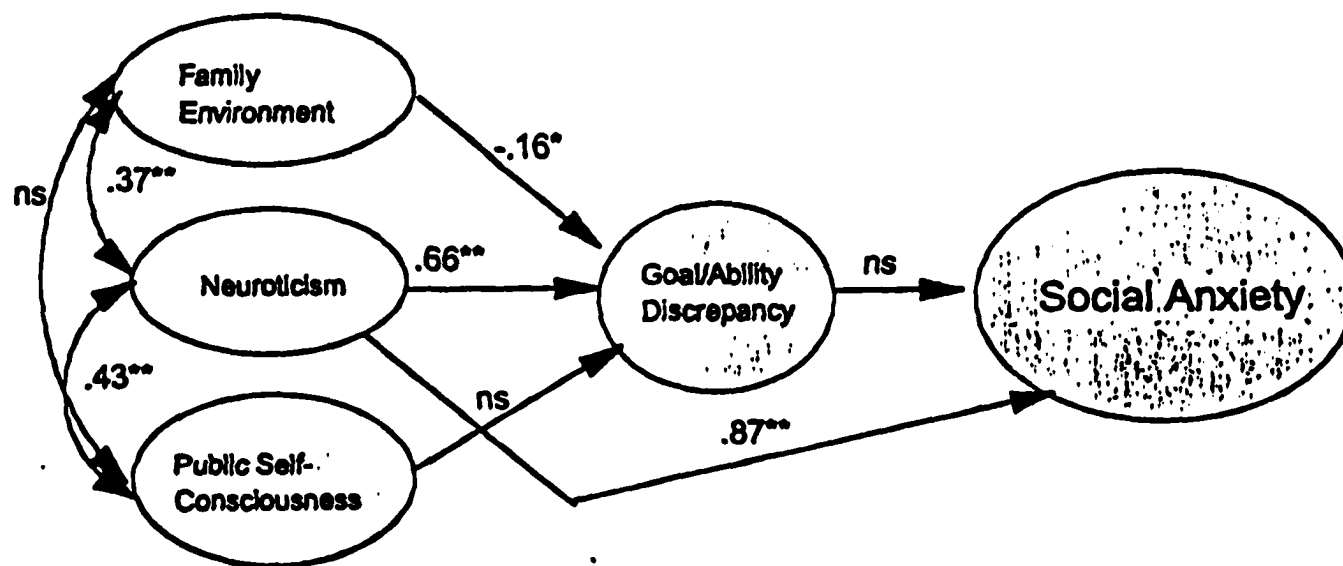


Figure 6. Results of model two tested in sample two.

The path estimates and correlations between exogenous variables for this model are presented in Figure 6 and in Table 8. Path estimates achieving significance were the path to *public self-consciousness* from *neuroticism* (γ_{13}), the path to *public self-consciousness* from *negative peer interactions* (γ_{12}), the path to *goal-ability discrepancy* from *neuroticism* (γ_{12}), and the path to *social anxiety* from *goal-ability discrepancy* (β_{22}). As evidenced in Figure 6 and Table 8, the intercorrelations among exogenous variables were all significant at the .05 level. Thirty-one percent of the total variance in *public self-consciousness* was accounted for by the exogenous variables, forty-five percent of the variance in *goal-ability discrepancy* was accounted for by *public self-consciousness* and *neuroticism*, and thirty-seven percent of the variance in *social anxiety* was accounted for by *goal-ability discrepancy*.

Fit statistics for Model 3 were moderate for sample two (see Table 9). Although the model resulted in a chi-square which was just significant (at $p < .05$), several other global fit indices were relatively high (GFI=.98, AGFI=.87, TLI=.82, CFI=.96). Path estimates achieving significance were the path to *goal-ability discrepancy* from *neuroticism* (γ_{12}) and to *social anxiety* from *neuroticism* (γ_{12}). The *family environment* to *goal-ability discrepancy* path (γ_{11}) again approached, but did not reach, significance. Path estimates can be found in Table 9 and Figure 7. Using Model 3, thirty-seven percent of the variance in *goal-ability discrepancy* was accounted for by the endogenous variables, and seventy-nine percent of the *social anxiety* variance was accounted for by paths from *goal-ability discrepancy* and



NOTE:

**** Indicates Significance $p < .05$**

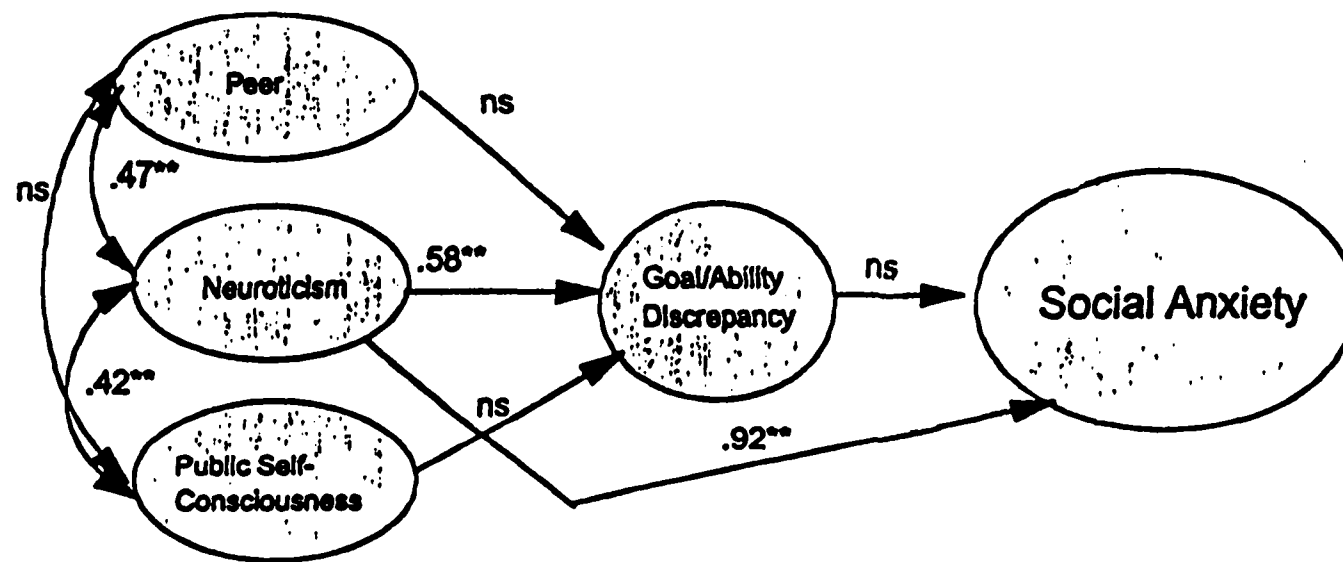
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Figure 7. Results of model three tested in sample two.

neuroticism. Two of three correlations among exogenous variables were significant at the .05 level (see Table 9 and Figure 7).

Because of the significant path from *negative peer interaction* to *public self-consciousness* in Model 2, an additional alternative model was tested against the performance of Model 3. This new model (Model 4, Figure 8) replaces the *family environment* construct in Model 3 with *negative peer interactions*. Because *family environment* has failed to achieve significance in all other tests of the model, it was theorized that exchanging it for *negative peer interactions* (social environment) might improve the fit of the model to the data. Goodness-of-fit indices for Model 4 are provided in Table 12. Model 4 achieved a significant Chi-square value, a GFI of .96, an AGFI of .73, a TLI of .66, and a CFI of .93. Paths significant in this model were the paths from *neuroticism* to *social anxiety* (γ_{12}) and to *goal-ability discrepancy* from *neuroticism* (γ_{13} ; see Table 12). Thirty-six percent of the variance in *goal-ability discrepancy* was accounted for by the endogenous variables. Paths from *neuroticism* and *goal-ability discrepancy* accounted for eighty-four percent of the variance in *social anxiety*. Two of three intercorrelations among exogenous variables were significant ($p < .05$), as shown in Table 12 and Figure 8.

The overall performance of Models 3 and 4 was superior to Model 2 in this sample. Chi-square and RMR were decreased through the use of Models 3 and 4, and measures of global fit were improved. Although the chi-square reduction between Model 3 and Model 4 appears to be significant, the differing constructs



NOTE:

****** Indicates Significance $p < .05$

***** Indicates Approach Toward Significance

Figure 8. Results of model four tested in sample two.

Table 12.
Structural model results: Model 4.

FIT INDICES							
	df	χ^2	GFI	AGFI	TLI	CFI	RMR
Model 4							
Sample 2	2	13.39	.96	.73	.66	.93	.04
Sample 3	2	15.76	.98	.85	.78	.96	.03

COMPLETELY STANDARDIZED PATH ESTIMATES			
Path		Sample 2	Sample 3
Negative Peer Interactions → Goal-Ability Discrepancy	γ_{11}	.02	.20**
Neuroticism → Social Anxiety	γ_{22}	.92**	.51**
Neuroticism → Goal-Ability Discrepancy	γ_{12}	.58**	.23**
Public Self-Consciousness → Goal-Ability Discrepancy	γ_{13}	.08	.31**
Goal-Ability Discrepancy → Social Anxiety	β_{21}	.01	.39**
Negative Peer Interactions → Neuroticism	ϕ_{12}	.47**	.27**
Negative Peer Interactions → Public Self-Consciousness	ϕ_{13}	-.02	.17**
Neuroticism → Public Self-Consciousness	ϕ_{23}	.42**	.58**
Goal-Ability Discrepancy (R^2)		.36	.31
Social Anxiety (R^2)		.84	.58

Note: Sample two n=150; Sample three n=309

Model 4= Alternate etiological model of social anxiety, including PEER (see Figure 8)

df=degrees of freedom; **GFI**=Goodness-of-Fit Index; **AGFI**= Adjusted Goodness-of-Fit Index; **TLI**= Tucker-Lewis Index (nonnormed fit index); **CFI**=Bentler's Comparative Fit Index; **RMR**= Root Mean Square Residual.

****** Signifies paths significant at $p < .05$

***** Signifies paths approaching significance

contained in the two models prevents their direct comparison using difference testing. Because Model 4 had not been tested against Model 3 in another sample, both models were cross-validated in the final sample.

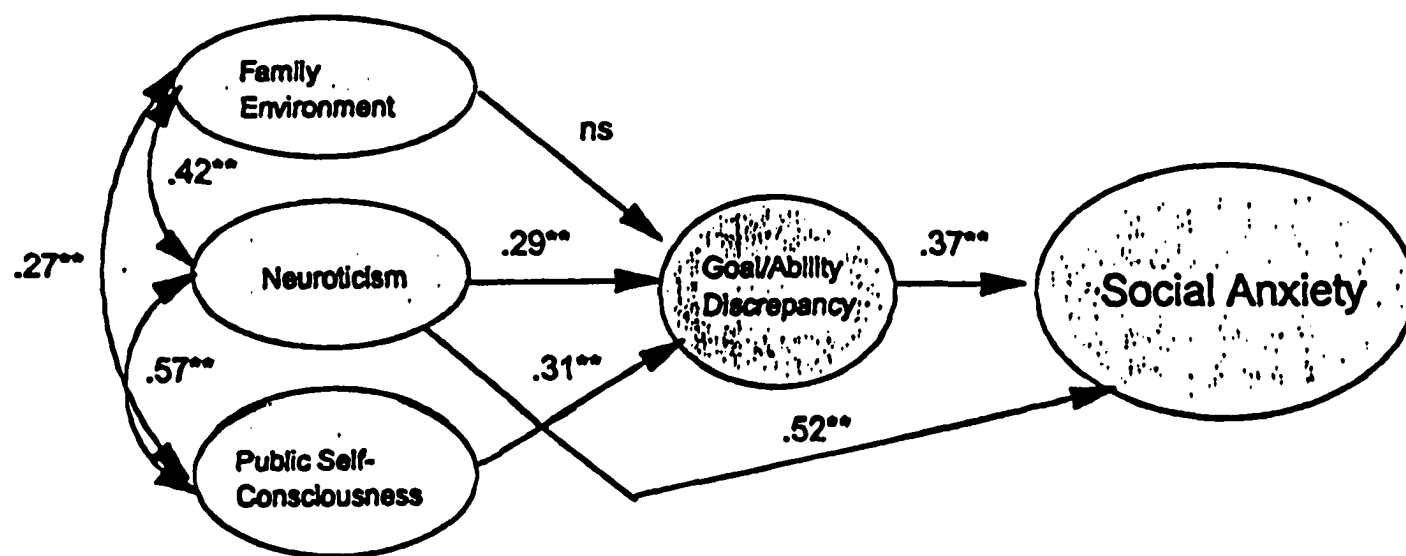
Evaluating the Structural Model-Phase Three

A summary of internal consistency information for all revised scales in sample three is provided in Table 13. The overall fit indices for Model 3 (alternate model of social anxiety, including the *family environment* construct) in sample three were fairly good (see Table 9). This model yielded a significant Chi-square and lower than desired TLI (.71) and AGFI (.80), however, GFI and CFI were in an acceptable range at .97 and .94, respectively. The path estimates and correlations between exogenous variables for this model are presented in Figure 9 and in Table 9. Path estimates achieving significance were the path to *goal-ability discrepancy* from *neuroticism* (γ_{12}), the path to *goal-ability discrepancy* from *public self-consciousness* (γ_{13}), the path to *social anxiety* from *neuroticism* (γ_{22}), and the path to *social anxiety* from *goal-ability discrepancy* (β_{11}). The path to *goal-ability discrepancy* from *family environment* (γ_{11}) did not achieve the .05 level of significance. As evidenced in Figure 9 and Table 9, the intercorrelations among exogenous variables were all significant at the .05 level. Twenty-eight percent of the total variance in *goal-ability discrepancy* was accounted for by the exogenous variables and fifty-nine percent of

Table 13.
Measurement statistics for sample three (revised measures).

Construct	FIT INDICES						INTERNAL CONSISTENCY		
	df	χ^2	GFI	AGFI	TLI	CFI	Comp. α	Coeff. α	AVE
Family Environment	2	27.93	.96	.80	.77	.92	.76	.72	.46
Negative Peer Interactions	5	22.87	.97	.91	.96	.98	.91	.91	.67
Neuroticism	27	84.28	.93	.89	.91	.93	.81	.74	.36
Public Self-Consciousness	9	49.79	.95	.88	.72	.83	.66	.66	.26
Goal/Ability Discrepancy	135	279.07	.90	.88	.86	.88	.85	.85	.25
Social Anxiety	464	1678.84	.66	.61	.70	.72	.93	.89	.32

Note: df= degrees of freedom; Comp. α = composite alpha; Coeff. α = coefficient alpha; AVE= average variance extracted.



NOTE:

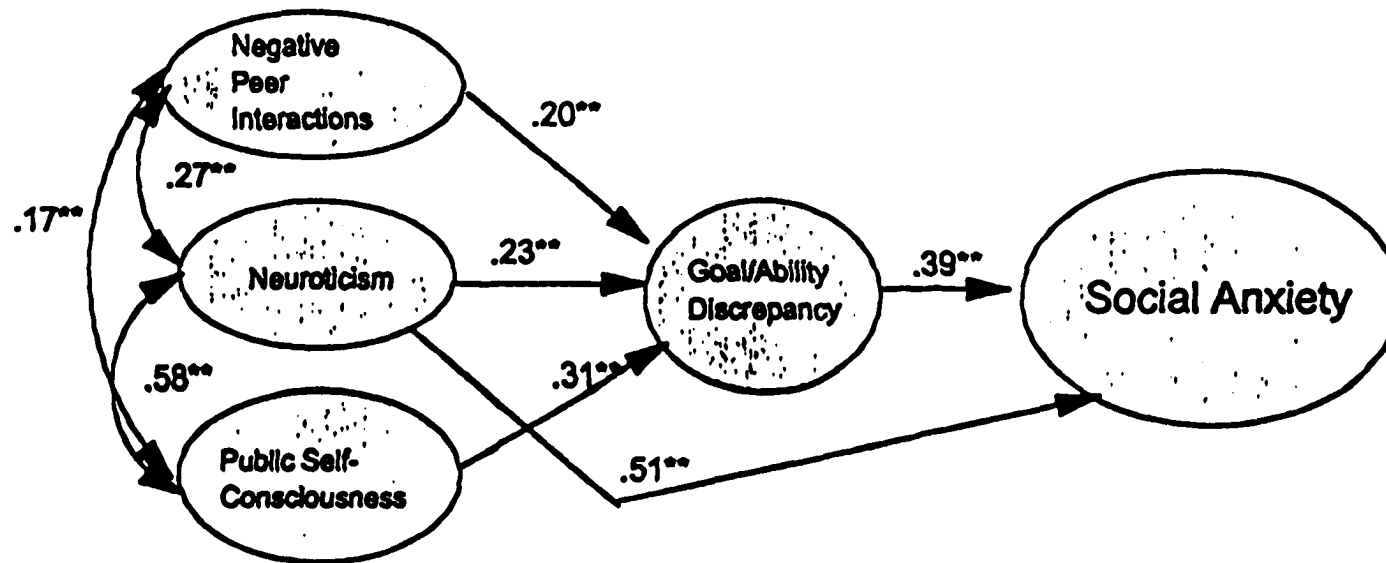
** Indicates Significance $p < .05$

* Indicates Approach Toward Significance

Figure 9. Results of model three tested in sample three.

the variance in *social anxiety* was accounted for by paths leading from *goal-ability discrepancy* and from *neuroticism*.

Indices of global fit for Model 4 (alternate model of social anxiety, including the *negative peer interactions construct*) in sample three were also good (see Table 12. Like Model 3, this model yielded a significant Chi-square and slightly lower than desired TLI (.78) and AGFI (.85), however, GFI and CFI were again in an acceptable range at .98 and .96, respectively. The path estimates and correlations between exogenous variables for this model are presented in Figure 10 and in Table 12. All path estimates in this model achieved significance, and the correlations between exogenous variables were all significant ($p < .05$). Significant paths in this model were the path to *goal-ability discrepancy* from *negative peer interactions* (γ_{11}), the path to *goal-ability discrepancy* from *neuroticism* (γ_{12}), the path to *goal-ability discrepancy* from *public self-consciousness* (γ_{13}), the path to *social anxiety* from *neuroticism* (γ_{22}), and the path to *social anxiety* from *goal-ability discrepancy* (β_{21}). Thirty-one percent of the total variance in *goal-ability discrepancy* was accounted for by the exogenous variables and fifty-eight percent of the variance in *social anxiety* was accounted for by paths leading from *goal-ability discrepancy* and from *neuroticism*. (Intercorrelations among revised measures for sample three are provided in Table 14.)



NOTE:
** Indicates Significance $p < .05$

Figure 10. Results of model four tested in sample three.

Table 14.
Correlations among revised measures for phase three sample

	FAMENV	PEER-r	EPQR-Ss	ATTR	PSC-r	G-A DISCREP	SOCANX
FAMENV	1.00						
PEER-r	.16**	1.00					
EPQR-Ss	.27**	.20**	1.00				
ATTR	.03	.19**	.22**	1.00			
PSC-r	.18**	.13*	.37**	.06	1.00		
G-A DISCREP	.14*	.27**	.38**	.14*	.34**	1.00	
SOCANX	.34**	.30**	.53**	.25**	.46**	.53**	1.00

Note: N=309

FAMENV= Family environment composite variable (Parental Attitudes Toward Child Rearing scale plus Fear Questionnaire-Parents' average)

PEER-r= Negative peer interactions-revised questions

EPQR-Ss= Eysenck Personality Questionnaire-RS- shortened version

ATTR=Perceived attractiveness questions

PSC-r= Public Self Consciousness Scale-revised version

G-A DISCREP= Goal-ability discrepancy

SOCANX= Social anxiety composite variable (Fear of Negative Evaluation Scale plus Social Interaction Anxiousness Scale)

** Correlations significant at $p < .01$

* Correlations significant at $p < .05$

DISCUSSION

Prior to discussion of the results, some limitations of the sample must be presented. The current sample was composed entirely of relatively young college students enrolled in psychology courses. The participants were primarily Caucasian, and more females participated than did males. Although this sample is typical of psychology research performed with volunteer undergraduate participants, these results must be generalized with caution outside the parameters of this sample.

A second caveat of the results concerns the methodology. Despite the unfortunate name often applied to structural modeling, “causal modeling,” this methodology is not an experimental paradigm and, therefore, cannot prove causality. Although support for some causal relationships can be derived through these types of studies, other models incorporating different variables, may fit the data equally well. In fact, one or more of the variables discussed in the Purpose portion of this manuscript may be useful additions to any model of social anxiety. They were excluded from the present study due to their lack of research support; however, further research pertaining to these variables may provide evidence of a substantial role for any one of these constructs in the etiology of social anxiety. In short, the present study should be considered an examination of possible etiological factors and their interrelationships, rather than being viewed as a comprehensive examination of all possible social anxiety risk factors.

The most salient results of the measurement portion of sample one concerns the poor psychometric properties of a number of the measures. Most significant were the

low variance extracted estimates of many of the scales. Although the measures were retained (in modified form) in the current study due to their history of use in the examination of social anxiety, these psychometric weaknesses should be rectified in future studies. Although adequate for the initial investigations of phenomena such as public self-consciousness, more carefully crafted measures are needed by the refined statistical procedures currently employed, such as SEM. Efforts should be made to revise and trim psychometrically poor scales and to re-examine their previously documented relationships.

General results of the present study will be discussed with primary emphasis placed on the cross-validation sample. According to the models best supported in this study (Models 3 and 4), *social anxiety* is a function of *negative peer interactions*, *neuroticism*, *public self-consciousness*, and *goal-ability discrepancy*. The identified models include a strong, direct influence of *neuroticism* on *social anxiety*. Some of the variance in *social anxiety* is also accounted for by a separate pathway. This second pathway supports the contention that neurotic, publicly self-conscious individuals with patterns of negative social interactions in childhood may develop discrepancies in their ability to meet their goals for social interactions. This social *goal-ability discrepancy* is the final proximal predictor of *social anxiety*, and mediates the effects of the *negative peer interaction* and *public self-consciousness* variables. *Goal-ability discrepancy* also mediates a portion of the effect of *neuroticism*. The alternate pathways supported in the present investigation may be helpful in elucidating the means by which the general proclivity toward anxiety disorders (based in neuroticism)

becomes directed toward particular stimuli. The second path to *social anxiety* (*negative peer interactions plus neuroticism plus public self-consciousness through goal-ability discrepancy*) may include the determinants of an individual developing socially-based fears as opposed to fears of heights (i.e., specific phobia) or fears of bodily sensations (i.e., panic disorder). The components of the model and the possible interpretations of the pathways are discussed further below.

The most striking result of the current investigation is the evidence for neuroticism as a very significant determinant of the development of social anxiety. This result supports studies of both shyness and social phobia which have found evidence for a relationship between neuroticism and social reticence (e.g., Amies et al., 1983; Gilmartin, 1987; Jones et al., 1986; Stemberger et al., 1995; Watson et al., 1988). According to Eysenck (1967), high scores on neuroticism indicate emotional lability and overresponsiveness to environmental stimulation and emotional experiences. This high level of responsiveness is thought to aid in some types of conditioning experiences, thereby enhancing the learning of specific (emotional) associations. Again, the second pathway to social anxiety included in the current model may contain the specific conditioning experiences which determine an individual's anxiety disorder presentation.

Neuroticism and the other components of Eysenck's personality theory (extraversion, psychoticism) have been consistently found to be heritable (e.g., Plomin, Chipuer, & Loehlin, 1990; Tellegen, Lykken, Bouchard, Wilcox, Segal, & Rich, 1988), which fits with evidence of a possible genetic predisposition toward developing social

anxiety (Bruch & Heimberg, 1994; Daniels & Plomin, 1985; Fyer et al., 1993; Plomin & Daniels, 1986). Eysenck's neuroticism construct has been replicated across nationalities and cultural contexts (Barrett & Eysenck, 1984), and across methodologies (Eysenck & Long, 1986). The neuroticism construct has also been proposed as a member of the "big five" primary personality dimensions, which have also been evidenced cross-culturally employing a variety of methodologies (Botwin & Buss, 1989; Church & Katigback, 1989; Costa & McCrae, 1988; Noller, Law & Comrey, 1987; Peabody & Goldberg, 1989; Watson, 1989). The cross cultural nature, widely replicable nature of this construct (viewed by some as a predisposition toward general negative affectivity) has led some authors to propose neurological underpinnings of this traits (e.g., Depue, Luciana, Arbisi, Collins, & Leon, 1994).

All of these sources of evidence combine to suggest that there are likely a large number of personality traits and symptom presentations which share some association with a global neuroticism superfactor. Because these individual traits and syndromes have unique variance as well as overlapping with neuroticism (see Hull, Tedlie, & Lehm, 1995), many of the associations produced in other research may actually be driven by the neuroticism construct.

The results of the current study are consonant with the hypothesis of neuroticism as a general "driver" variable because of the large amount of variance accounted for by the psychometrically poor neuroticism construct. Lesser variables, which had been examined in independent studies, were found to have little total effect within the model due to the overriding influence of neuroticism. This suggests that

previous research may have actually been tapping the association with neuroticism when it was believed that an independent action of another variable (like attractiveness) on social anxiety was being tested.

Caution is needed, however, when proposing such an interpretation of this, and other, correlational research findings. The first difficulty concerns the testing of neuroticism, a presumably “biologically based” trait, using a self-report methodology in adulthood. It is irresponsible to suggest that environment could not have impacted the responses given on a pen-and-paper measure completed by adults. The very variables dwarfed in action by the neuroticism construct (e.g., *family environment*, *attractiveness*) could have influenced the individual at an earlier developmental point to produce what we now call neuroticism. Therefore, although Eysenck (1982) purports that two-thirds of personality is genetically determined, within the constraints of the current methodology, we can only conclude that *neuroticism* and *social anxiety* are reliably associated. The fact that both direct and indirect paths from *neuroticism* to *social anxiety* were statistically supported also lends credence to hypothesis that both environmental and biologically-based factors play a role in social anxiety. The indirect path suggests that the general, possibly biologically influenced, factor *neuroticism* was mediated to some extent by environmental variables such as *negative peer interactions*, *public self-consciousness*, and *goal-ability discrepancy*. However, the exact nature of the relationship between these variables remains unclear pending future longitudinal etiological research. One clear recommendation derived from the current research is that future social anxiety research of all types should include measurement of

neuroticism, so that the effects of other variables may be viewed within their proper context.

Another hypothesis in this study was that disrupted childhood *family environment* would be associated with greater *social anxiety* (mediated by *public self-consciousness* and *goal-ability discrepancy*). This hypothesis was derived from an extensive body of theoretical writing and empirical research in both the shyness and social anxiety literatures (e.g., Arrindell et al., 1983; Bruch & Heimberg, 1994; Buss, 1980, 1986; Leung et al., 1994; Mills & Rubin, 1993). Surprisingly, the results of the present study did not support a significant role of family environment in the etiology of social anxiety. Family environment did, however, have significant associations with all other variables in the model.

There are several possible means of reconciling these results with the body of literature. Most importantly, and already discussed at length, concerns the suspect nature of common (and current) operationalizations of neuroticism. Although neuroticism is conceived as a genetically influenced personality predisposition, the questionnaire traditionally used to measure neuroticism (see Appendix G) contains many questions whose responses may have been influenced by aspects of nurture as well as by nature (e.g., “Are you a worrier?”, “Are you often troubled by feelings of guilt?”, “Are your feelings easily hurt?”). Therefore, the variance typically associated with family environment may have been subsumed in the variance attributed to the more powerful *neuroticism* variable. Because previous studies of family environment’s role in social anxiety have not concurrently examined neuroticism, the possible overlap

between the two concepts had not previously been examined. For this reason, it is again suggested that future social reticence research include the neuroticism variable so that comparisons of the relative strength of other variables may be made.

Second, although the measures of family environment employed in the current study have been widely used, there is always the possibility that these measures do not accurately tap the hypothesized construct. Another measure of family environment with a difference focus may have performed quite well within this model. It should also be remembered that, due to the retrospective nature of this measure, faulty or biased memory cannot be dismissed as a cause of the poor performance of this variable. Therefore, it cannot be assumed that family environment, accurately measured, would not be a good predictor of the development of social anxiety.

This study replicated previous research indicating that negative childhood peer interactions are related to the presence of social anxiety (e.g., Coie & Dodge, 1983; Coie & Kupersmidt, 1983; Gilmartin, 1987). The trimming of one peer interaction item prior to the analysis of structural relationships led to this construct reflecting primarily childhood neglect experiences, rather than childhood rejection or abuse by peers. Results of the cross-validation sample support childhood social environment (*negative peer interactions*) as a factor in the development of social anxiety (by impacting *goal-ability discrepancy*). Because of the instability of this construct's action, future research employing this construct should be conducted to determine population or situational determinants of the importance of this construct. It is

recommended that neglect and rejection experiences be examined for separate effects in future studies.

Because physical attractiveness is a well-established social facilitator (e.g., Berscheid, 1985; Feingold, 1992; Garcia et al., 1991) and because socially reticent individuals have been found to underreport their physical attractiveness, it was hypothesized that *perceived attractiveness* would be associated with *social anxiety* (by impacting *public self-consciousness* and *goal-ability discrepancy*). This hypothesis was not borne out in the present study. *Perceived attractiveness* was substantially related to several other exogenous variables in all three samples; however, did not appear to have a significant association with the mediating variable *public self-consciousness*. *Perceived attractiveness* was found to be significantly related to *social anxiety* and *goal-ability discrepancy* in two of the three samples. This pattern of correlations may point to an unstable relationship between *perceived attractiveness* and *social anxiety*. Or, the effects of this construct, like those of *family environment*, may be subsumed in the action of the *neuroticism* construct. Because the *neuroticism* and *perceived attractiveness* constructs are significantly related in all of the present samples, it is possible that previous studies finding a relationship between perceived attractiveness and social reticence were actually being influenced by the effects of a common third construct, neuroticism. Future attempts to document a relationship between perceived attractiveness and social anxiety should be viewed as incomplete if they do not partial out the variance attributable to neuroticism.

Another hypothesis initially presented in this study was that *public self-consciousness* mediated the relationship between the exogenous variables and *goal-ability discrepancy*. Examination of the Phase One results led to the modification of this hypothesis. Because it was not contraindicated by previous research (which just supported a relationship between *public self-consciousness* and *social anxiety*), *public self-consciousness* was subsequently examined as an exogenous variable. In sample three, significant paths to *goal-ability discrepancy* from *public self-consciousness* were achieved in both models. *Public self-consciousness* was highly related to other exogenous and endogenous variables, including *neuroticism*. Therefore, it may, again, be possible that the effects of public self-consciousness in other studies have been driven, at least partially, by shared variance with neuroticism. In the present study, there were indications of some unique effects attributable to *public self-consciousness*. However, results of the initial samples recommend that future studies examining the relationship of public self-consciousness and social anxiety take into account the impact of neuroticism as a possible influencing variable.

This study supported the association between *goal ability discrepancy* and *social anxiety*. The primary significance of this construct for *social anxiety* were diminished, however, with the addition of a direct path from *neuroticism* to *social anxiety*. Therefore, the effects of this construct in mediating other variables may be largely dependent on its interaction with *neuroticism*. Paths from the exogenous variables accounted for a significant portion of the variance in *goal ability discrepancy*. This finding indicates that the presence of this sort of conflict between desired social

skills and one's perceived ability to fulfill those expectancies can, to a significant extent, be explained through the association with variables such as *neuroticism* and *public self-consciousness* and *negative childhood peer interactions*.

The present study found strong statistical support for both Model 3 and Model 4 in several samples. Using widely accepted guidelines for goodness-of-fit, both models were found to explain the sample two and sample three data adequately. As these models contain different constructs (substituting *peer interactions* for *family environment* in Model 4), they cannot be directly compared using statistical means. Even casual comparison, however, indicates that neither model is clearly superior, with Model 3 performing slightly better in sample two, and Model 4 edging out Model 3 in the cross-validation sample. This conflict aptly demonstrates the previously discussed shortcomings of structural equation modeling. This procedure cannot provide unequivocal evidence for causal relationships among variables in the model. Nor can an appropriately fitting model be considered to be the definitive answer to a causal question. Just as the exchange of a construct in the present study (replacing *family environment* with *negative peer interactions* in Model 4) created an alternative, equally sound model, so too, may there be other viable constructs not tested within this model which could add to our understanding of social anxiety. The fact that the *family environment* to *goal-ability discrepancy* path did not achieve significance in Model 3, and all paths were significant in Model 4, may enhance the explanatory utility of the relationships depicted in Model 4 as compared with Model 3. However, both models are conceptually viable, so neither should be discounted.

In sum, the present study strongly supports the association between *neuroticism* and *social anxiety*. Support was also given for relationships between *social anxiety* and the constructs of *goal-ability discrepancy*, *public self-consciousness*, and *negative peer interactions*. The overall trends in evidence do not support the relationship of *family environment* or *perceived attractiveness* with *social anxiety* (other than through shared variance produced by the *neuroticism* construct). The current models implicate both biological and environmental factors in the development of social anxiety.

The results of this study point to a continuing need to examine a wide range of variables in correlational studies in order to acknowledge that the studied variables may not produce their effects in isolation. Due to the strong showing of the neuroticism variable, it is recommended that this variable be prominently examined in future studies. The results of this study should also prompt continuing refinement of the measures commonly used in clinical and developmental research. Other conclusions which may be drawn from this study reflect the compatibility of findings across the social anxiety and shyness literatures. It is hoped that future research into the etiology of social reticence will view these constructs as a possible continuum and draw freely from both bodies of literature. Although this research sought to begin the process of model development, this study by no means completes that process. It is hoped that extensions of the present study will be conducted to refine the current model and develop an even more explanatory model of social anxiety. Finally, despite the possible contributions of the present study, this methodology cannot replace longitudinal

research. Long-term research, beginning in infancy and early childhood, is badly needed to address the questions of directionality which always remain following even methodologically sophisticated correlational research.

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APPENDIX A

INFORMED CONSENT

1. **Study Title-** Social behavior investigation
2. **Performance Sites-** Audubon Hall, LSU
3. **Investigators-** The following investigators are available for questions during regular business hours at 388-1494: Michele E. McCarthy, M.A.

Donald A. Williamson, Ph.D.

4. **Purpose of the study-** By providing information about the personality and rearing variables, volunteers will aid in the examination of the possible etiological determinants of patterns of social behavior.
5. **Volunteer Inclusion/Exclusion-** This study will include all willing, literate undergraduate student volunteers.
6. **Description of the study-** Volunteers will complete a set of questionnaires querying their beliefs, emotions, and behaviors in certain situations. Responses to these questionnaires will be subjected to path analysis/structural equation modeling analysis. Completion of the questionnaires should be accomplished in less than 1 hour. This will complete the volunteer's participation in the study. Approximately 400 volunteers will complete the study in 1 year's time.
7. **Benefits-** Volunteers will receive extra credit points (commensurate with time of participation) to be applied to their psychology course grades. Others may benefit from this research through identification of the processes by which patterns of behavior develop.

8. **Risks/Alternatives-** No risks are anticipated from participation in this research.

Alternative methods of deriving similar information would be more long-term and intrusive, therefore, this procedure is believed to be the least intrusive of alternatives.

9. **Right to refuse-** Volunteers may choose to withdraw from the study at any time with no penalty other than the forfeiture of extra credit not yet earned. (Extra credit for participation time prior to withdrawal will be awarded.)

10. **Privacy-** The results of this study may be published, however, study participants will not be personally identifiable, nor will data be linked to subjects in any way (data will be coded through the use of randomly assigned subject numbers).

11. **Signatures-** The study has been discussed with me and all my questions have been answered. I understand that additional questions regarding the study should be directed to the investigators listed above. I understand that if I have questions about subject rights, or other concerns, I can contact the Vice Chancellor of the LSU Office of Research and Economic Development at 388-5833. I agree with the terms above and acknowledge that I have been given a copy of the consent form.

Volunteer signature

Witness/Investigator signature

Date: _____

APPENDIX B
DEMOGRAPHIC QUESTIONNAIRE

AGE: _____

SEX: Male Female

RACE:

Caucasian African-American Hispanic Asian Other _____

NEGATIVE PEER INTERACTIONS QUESTIONNAIRE

(1=Strongly agree; 7=Strongly disagree)

When I was a child.....

_____ I was the "left out" child in any group.

_____ I was always chosen last for teams.

_____ I was never in the "in" group.

_____ I was usually ignored by my peers.

_____ **I was often teased/picked on by other children.**

_____ Other children made fun of me/harassed me.

APPENDIX D

PERCEIVED ATTRACTIVENESS QUESTIONS

RATE EACH OF THE FOLLOWING QUESTIONS ON A SCALE OF 1-7

(1=Strongly agree; 7=Strongly disagree)

$$\langle \text{-----} \rangle$$

1 Strongly agree 7 Strongly disagree

RATING

 I am attractive.

 I was a cute kid.

 When I was a teenager, I thought I was good looking.

 My looks are pleasing to me.

APPENDIX E

SOCIAL BEHAVIOR QUESTIONNAIRE- VERSION S-A

DIRECTIONS: For each situation, choose the rating (from 1-9) rating which most accurately describes your **typical behavior in similar situations**. (HOW YOU REALLY BEHAVE) Examples of behaviors have been given to help you rate your level of performance. For instance, a rating of "1" would mean that you typically behave in a manner that is very much like the example of rating 1 behavior given. If your behavior is similar to the example behavior of level "5," you would choose 5 for your answer. Feel free to choose any number between 1 and 9.

SITUATION ONE: Getting into a group conversation which is already started

- 9: You join into the conversation as soon as you walk up, and you keep the conversation lively from that point on.
- 5: You listen in on the conversation for several minutes, then begin to join in when you have relevant comments.
- 1: You become tongue tied and are unable to contribute to the conversation at all.

<----->
1 2 3 4 5 6 7 8 9

SITUATION TWO: Starting a conversation with someone you don't know at a party/bar

- 9: You initiate a lively discussion with the person and there are no pauses in your conversation.
- 5: You are slightly hesitant to speak, but you are able to introduce yourself and start a conversation.
- 1: You are unable to speak at all, and turn and walk away.

<----->
1 2 3 4 5 6 7 8 9

SITUATION THREE: Refusing unreasonable requests

9: You calmly explain to the person that their request is unreasonable and you discuss your reasons for refusing.

5: You decline the request and give the person a vague excuse for not being able to fulfill their wishes.

1: You are unable to refuse the request, so you perform the function as asked.

<----->
1 2 3 4 5 6 7 8 9

SITUATION FOUR: Being "put on the spot" to talk about something in a group

9: You immediately launch into an interesting and detailed discussion of the subject.

5: You pause slightly to organize your thoughts, then you begin to discuss the topic.

1: You are unable to think of anything to say and you stand there silently until someone comes to your rescue.

<----->
1 2 3 4 5 6 7 8 9

SITUATION FIVE: Maintaining a conversation with a peer

9: The conversation is maintained without any apparent effort, and you allow no gaps in the conversation.

5: There are brief gaps in the conversation, but you never really run out of things to say.

1: The conversation is stilted and full of long pauses, and you are not able to think of any new topics to introduce.

<----->
1 2 3 4 5 6 7 8 9

SITUATION SIX: Calling a business establishment on the phone to ask a difficult/tricky question

9: You make sure your question is understood immediately, and you are in complete control of the conversation.

5: You make your question understood although you may have to repeat yourself a few times.

1: Your question is misunderstood, but you do not clarify it, instead you hang up without getting the information you needed.

<----->

1 2 3 4 5 6 7 8 9

SITUATION SEVEN: Resisting a high-pressure salesperson

9: You take control of the discussion, prevent the person from returning to their pressured sales pitch, and firmly decline to purchase the product.

5: You are trapped for several minutes hearing about the product, but finally tell the person several times that you are not interested and hurry away so that they cannot continue to pressure you.

1: You are unable to be assertive with the salesperson and you end up purchasing a product you do not want in order to escape from their sales pitch.

<----->

1 2 3 4 5 6 7 8 9

SITUATION EIGHT: Speaking to an authority figure about a work related problem

9: You approach the person confidently and initiate a lengthy discussion with them, pointing out several solutions to the problem.

5: You hesitantly approach the person and hold the necessary conversation with them, excusing yourself when the conversation is over.

1: You avoid speaking to them directly, and instead write them a letter describing the situation.

<----->

1 2 3 4 5 6 7 8 9

SITUATION NINE: Small group work in a class or on the job

- 9: You take charge and organize the group, becoming the leader of the meetings.
- 5: You participate equally in the group and contribute your knowledge when needed.
- 1: You participate less than the other group members and speak only when questions are posed directly to you.

<----->
1 2 3 4 5 6 7 8 9

SITUATION TEN: Presentation for your job or in a class

- 9: You flawlessly inform your audience with an entertaining presentation.
- 5: You stumble over a few words initially, but adapt to the situation and give your presentation reasonably well.
- 1: You start to give the presentation while stuttering and stammering, and then obviously cut short the length of your talk.

<----->
1 2 3 4 5 6 7 8 9

SITUATION ELEVEN: Dining alone in a (non-fast food) restaurant

- 9: You dine at a leisurely pace and strike up a conversation with another individual who is also dining alone.
- 5: You eat a little bit more rapidly than usual, but are not obviously rushing to finish.
- 1: You cannot bring yourself to enter the restaurant alone.

<----->
1 2 3 4 5 6 7 8 9

SITUATION TWELVE: Athletic performance situations (getting up to bat, serving at volleyball, free throws) or performance auditions (music, dance, theater)

- 9: You confidently approach the situation, complete your task well, and entertain your audience.
- 5: You ignore your slight nervousness and concentrate on doing your best in the situation.
- 1: You hurry through the action hoping that no one is looking at you, caring less about the outcome than on finishing quickly.

<----->
1 2 3 4 5 6 7 8 9

SITUATION THIRTEEN: Working while being observed

9: You are not bothered by the attention and perform your tasks confidently, even better than when you are alone.

5: You are a bit tense at being watched, but you perform your job as usual.

1: Your nervousness makes you forget your tasks and you make several errors in things you typically do well.

<----->
1 2 3 4 5 6 7 8 9

SITUATION FOURTEEN: Writing while being observed (signing checks, filling out forms)

9: You complete the task without any problems or concerns.

5: Although your handwriting is less than perfect, you complete the task adequately.

1: Your hand begins to shake uncontrollably and you excuse yourself from the situation.

<----->
1 2 3 4 5 6 7 8 9

SITUATION FIFTEEN: Job/professional school interview

9: Your interview goes extremely well and you have no doubts about your performance after you leave.

5: You conduct yourself well during the interview and only think of a few things you could have improved after you leave.

1: You stumble through the interview and later berate yourself for all of your responses.

<----->
1 2 3 4 5 6 7 8 9

SITUATION SIXTEEN: Asking someone for a date

9: You integrate your invitation into a conversation with ease and with very little hesitation.

5: You appear moderately nervous about asking the person out, but you are able to accomplish it adequately.

1: You rush through the invitation, stumbling over your words, and retract the invitation before the person responds.

<----->
1 2 3 4 5 6 7 8 9

SITUATION SEVENTEEN: Giving a party

9: You spend the entire party enjoying the presence of your friends, and you have a great deal of fun.

5: You are initially focussed on making the party run smoothly, but you relax and enjoy yourself once the party is underway.

1: Your focus on making sure nothing goes wrong overshadows your enjoyment completely, and you never relax enough to have fun.

<----->
1 2 3 4 5 6 7 8 9

SITUATION EIGHTEEN: Going to a social function alone

9: You become the life of the party immediately upon entering and never lack companionship throughout the function.

5: You join into a number of conversations during the function and spend very little time without anyone with whom to talk.

1: You do not interact with many people during the function and spend much of your time alone by the refreshments.

<----->
1 2 3 4 5 6 7 8 9

APPENDIX F

SOCIAL BEHAVIOR QUESTIONNAIRE- VERSION O-O

DIRECTIONS: For each situation, choose the rating (from 1-9) which most accurately describes the way **someone important to you thinks you ought to behave in similar situations.** (HOW THEY WANT YOU TO BEHAVE). Examples of behaviors have been given to help you rate the level of performance this person expects of you. For instance, a rating of "1" would mean that this person believes you should behave in a manner similar to the example of rating "1" behavior given. If this person believes your behavior ought to be similar to the example behavior of level "5," you would choose 5 as your answer. Remember, you can choose any number from 1 to 9.

SITUATION ONE: Getting into a group conversation which is already started

- 9: You join into the conversation as soon as you walk up, and you keep the conversation lively from that point on.
- 5: You listen in on the conversation for several minutes, then begin to join in when you have relevant comments.
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<----->
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1: You are unable to be assertive with the salesperson and you end up purchasing a product you do not want in order to escape from their sales pitch.

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9: You become the life of the party immediately upon entering and never lack companionship throughout the function.

5: You join into a number of conversations during the function and spend very little time without anyone with whom to talk.

1: You do not interact with many people during the function and spend much of your time alone by the refreshments.

<----->
1 2 3 4 5 6 7 8 9

APPENDIX G

MEANS AND STANDARD DEVIATIONS FOR STANDARD AND REVISED MEASURES FOR SAMPLES ONE, TWO, AND THREE.

	Sample 1 (n=100)	Sample 2 (n=150)	Sample 3 (n=309)
PACR-IS	10.78 (4.16)	10.45 (4.06)	10.41 (3.80)
PACR-OO	10.56 (3.76)	9.98 (3.78)	10.11 (3.36)
PACR-FS	13.77 (4.08)	14.02 (3.89)	14.42 (3.72)
PACR-SH	9.96 (4.35)	9.80 (4.00)	9.51 (3.70)
PACR-OO/SI	15.49 (6.36)	14.81 (6.06)	14.79 (5.49)
FQ-PAR	11.13 (5.35)	14.10 (6.20)	13.07 (5.73)
FQ-MOTHER	11.99 (5.77)	15.06 (7.10)	13.82 (6.90)
FQ-FATHER	10.27 (6.57)	13.17 (7.99)	12.42 (7.15)
PEER	15.05 (7.55)	15.01 (7.85)	15.57 (8.88)
PEER (REVISED)	12.46 (6.44)	12.42 (6.55)	12.89 (7.52)
EPQR-S	17.33 (3.32)	17.67 (3.12)	17.58 (3.76)
EPQR-S (REVISED)	11.85 (2.37)	11.97 (2.10)	12.06 (2.50)
ATTR	13.34 (5.31)	12.97 (5.50)	12.97 (5.43)

(table con'd)

	Sample 1 (n=100)	Sample 2 (n=150)	Sample 3 (n=309)
PSC	11.46 (1.81)	12.08 (1.64)	11.89 (1.82)
PSC (REVISED)	9.63 (1.69)	10.17 (1.56)	10.01 (1.70)
SBQ-SA	73.08 (19.97)	75.45 (19.39)	75.00 (21.09)
SBQ-OO	47.27 (20.70)	49.37 (19.91)	50.34 (21.30)
SBQ-G/A DISCREPANCY	32.27 (19.08)	35.25 (18.21)	33.29 (17.15)
SIAS	41.21 (16.46)	45.25 (13.46)	45.56 (14.42)
FNE	5.85 (3.48)	7.06 (3.57)	6.71 (3.71)

Note: PACR-IS= Parental Attitudes toward Child Rearing Scale-Isolation subscale; PACR-OO= Parental Attitudes toward Child Rearing Scale-Others' Opinions subscale; PACR-FS= Parental Attitudes toward Child Rearing Scale-Family Sociability subscale; PACR-SH= Parental Attitudes toward Child Rearing-Shame subscale; FQ-PAR= Fear Questionnaire-parents' average; PEER= Peer neglect questions; EPQR-S= Eysenck Personality Questionnaire-revised-short form; ATTR= Perceived attractiveness questions; PSC= Self-Consciousness Scale-Public Self-Consciousness subscale; G-A DISCREP= Goal-ability discrepancy; SIAS=Social Interaction Anxiety Scale; FNE= Fear of Negative Evaluation Scale.

APPENDIX H

Correlations among standard measures for phase one sample.

	PACR-IS	PACR-OO	PACR-FS	PACR-SH	FQ-PAR	PEER	EPQR-S	ATTR	PSC	G-A DISCREP	SIAS	FNE
PACR-IS	1.00											
PACR-OO	.36**	1.00										
PACR-FS	-.70**	-.05	1.00									
PACR-SH	.32**	.65**	.03	1.00								
FQ-PAR	.40**	.12	-.39**	.15	1.00							
PEER	.44**	.13	-.44**	.01	.29**	1.00						
EPQR-S	.43**	.24**	-.26*	.27**	.29**	.29	1.00					
ATTR	.11	-.07	-.11	-.05	.06	.33**	.19	1.00				
PSC	-.02	.14	.07	.19	.16	.11	.33**	.15	1.00			
G-A DISCREP	.37**	.18	-.29**	.07	.29**	.30**	.45**	.19	.23*	1.00		
SIAS	.18	.07	-.15	.03	.21*	.29**	.22*	.03	.13	.25*	1.00	
FNE	.33**	.18	-.23*	.19	.20*	.34**	.56**	.39**	.50**	.47**	.32**	1.00

Note: N=100

PACR-IS= Parental Attitudes toward Child Rearing Scale- Isolation subscale; PACR-OO= Parental Attitudes toward Child Rearing Scale--Others' Opinions subscale; PACR-FS= Parental Attitudes toward Child Rearing Scale-Family Sociability subscale; PACR-SH= Parental Attitudes toward Child Rearing-Shame subscale; FQ-PAR= Fear Questionnaire-parents' average; PEER= Peer neglect questions; EPQR-S= Eysenck Personality Questionnaire-revised-short form; ATTR= Perceived attractiveness questions; PSC= Self-Consciousness Scale-Public Self-Consciousness subscale; G-A DISCREP= Goal-ability discrepancy; SIAS=Social Interaction Anxiety Scale; FNE= Fear of Negative Evaluation Scale. * Correlations significant at $p<.05$ ** Correlations significant at $p<.01$

APPENDIX I

Correlations among standard measures for phase two sample.

	PACR-IS	PACR-OO	PACR-FS	PACR-SH	FQ-PAR	PEER	EPQR-S	ATTR	PSC	G-A DISCREP	SIAS	FNE
PACR-IS	1.00											
PACR-OO	.45**	1.00										
PACR-FS	-.62**	-.23**	1.00									
PACR-SH	.39**	.58**	-.14	1.00								
FQ-PAR	.43**	.23**	-.43**	.22**	1.00							
PEER	.42**	.21*	-.26**	.26**	.31**	1.00						
EPQR-S	.16*	.04	-.08	.14	.18*	.24**	1.00					
ATTR	.24**	.13	-.14	.12	.08	.44**	.19*	1.00				
PSC	.004	.03	.03	.09	-.11	.001	.28**	.12	1.00			
G-A DISCREP	.35**	.09	-.15	.12	-.02	.26**	.40**	.27**	.17*	1.00		
SIAS	.18	.22**	-.30**	.25**	.35**	.50**	.55*	.33**	.10	.46**	1.00	
FNE	.13	.001	-.14	.15	.10	.13	.57**	.21*	.56**	.29**	.42**	1.00

Note: N=150

PACR-IS= Parental Attitudes toward Child Rearing Scale- Isolation subscale; PACR-OO= Parental Attitudes toward Child Rearing Scale--Others' Opinions subscale; PACR-FS= Parental Attitudes toward Child Rearing Scale-Family Sociability subscale; PACR-SH= Parental Attitudes toward Child Rearing-Shame subscale; FQ-PAR= Fear Questionnaire-parents' average; PEER= Peer neglect questions; EPQR-S= Eysenck Personality Questionnaire-revised-short form; ATTR= Perceived attractiveness questions; PSC= Self-Consciousness Scale-Public Self-Consciousness subscale; G-A DISCREP= Goal-ability discrepancy; SIAS=Social Interaction Anxiety Scale; FNE= Fear of Negative Evaluation Scale.

* Correlations significant at $p < .05$ ** Correlations significant at $p < .01$

APPENDIX J

Correlations among standard measures for phase three sample.

	PACR-IS	PACR-OO	PACR-FS	PACR-SH	FQ-PAR	PEER	EPQR-S	ATTR	PSC	G-A DISCREP	SIAS	FNE
PACR-IS	1.00											
PACR-OO	.49**	1.00										
PACR-FS	-.64**	-.23**	1.00									
PACR-SH	.48**	.60**	-.26**	1.00								
FQ-PAR	.37**	.29**	-.31**	.35**	1.00							
PEER	.18**	.11*	-.15*	.20**	.09	1.00						
EPQR-S	.28**	.12*	-.20**	.21**	.17**	.17**	1.00					
ATTR	.02	.008	-.13*	.06	.10	.20**	.22**	1.00				
PSC	.10	.12*	-.03	.12*	.08	.12*	.37**	.03	1.00			
G-A DISCREP	.17**	.11	-.10	.10	.09	.25**	.34**	.14*	.33**	1.00		
SIAS	.34**	.24**	-.30**	.30**	.29**	.28**	.48**	.24**	.33**	.51**	1.00	
FNE	.12*	.10	-.09	.20**	.15*	.19**	.51**	.19**	.65**	.42**	.57**	1.00

Note: N=309

PACR-IS= Parental Attitudes toward Child Rearing Scale- Isolation subscale; PACR-OO= Parental Attitudes toward Child Rearing Scale=Others' Opinions subscale; PACR-FS= Parental Attitudes toward Child Rearing Scale-Family Sociability subscale; PACR-SH= Parental Attitudes toward Child Rearing-Shame subscale; FQ-PAR= Fear Questionnaire-parents' average; PEER= Peer neglect questions; EPQR-S= Eysenck Personality Questionnaire-revised-short form; ATTR= Perceived attractiveness questions; PSC= Self-Consciousness Scale-Public Self-Consciousness subscale; G-A DISCREP= Goal-ability discrepancy; SIAS=Social Interaction Anxiety Scale; FNE= Fear of Negative Evaluation Scale.

* Correlations significant at $p < .05$

** Correlations significant at $p < .01$

VITA

Michele McCarthy was born in Munich, Germany, to Francis and Erika McCarthy. When she was thirteen, the family settled in Crestview, Florida, the place that Ms. McCarthy still thinks of as “home.” The author was graduated from Crestview High School in 1989. Since that time, she has lived in Baton Rouge, pursuing her bachelor’s, master’s, and doctoral degrees from Louisiana State University. The author has enjoyed her stay among the wonderful people of Louisiana and, following the completion of her dissertation, Ms. McCarthy plans to make a new “home” in New Orleans, Louisiana.

DOCTORAL EXAMINATION AND DISSERTATION REPORT

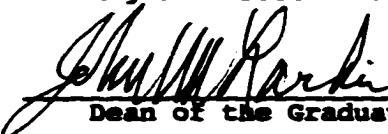
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Date of Examination:

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